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ABSTRACT

This report uses data from the National Longitudinal Study of the High School Class of 1972 and the High School & Beyond/Sophomores Study to summarize information on what is studied, where, and by whom, in the nation's colleges, community colleges, and postsecondary trade schools. Section 1 describes how the data is based on that which the taxonomy of courses and analyses of course-taking, credits, grades, degrees, etc., were constructed and edited. Section 2, "Degrees, Majors, Credits, and Time," presents the long-term educational attainment of the two cohorts of students (classes of 1972 and 1982). Section 3, "The Changing Shape of Delivered Knowledge," presents the taxonomy of courses, and includes the most common course titles in over 1,000 course categories, as well as enrollment trends by course category. Section 4 examines all credits earned by the two cohorts and identifies which courses account for most of those credits to yield an empirical "core curriculum." Section 5 provides data on proportions of students studying given subject categories; trend data is included for the past two decades. Finally, Section 6 provides data concerning such issues as trends in grade inflation and which courses students fail at high rates. The conclusion offers suggestions for further analysis of these data bases. (Contains 43 references.) (DB)

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The New College Course Map and Transcript Files

Changes in Course-Taking and Achievement, 1972–1993

Second Edition

U.S. Department of Education
Office of Educational Research and Improvement

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The New College Course Map and Transcript Files

Changes in Course-Taking and Achievement, 1972–1993

Second Edition

Based on the Postsecondary Records from
Two National Longitudinal Studies

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Executive Summary

This is a 2nd (and abbreviated) version of *The New College Course Map And Transcript Files*, first published by the U.S. Department of Education in 1995. *The New College Course Map* (CCM) presents a national tapestry of precisely what is studied, where, and by whom, in the nation's colleges, community colleges, and postsecondary trade schools.

The *Map* is based on empirical information gleaned from national samples of postsecondary transcripts embedded in two longitudinal studies: the National Longitudinal Study of the High School Class of 1972 (NLS-72) and the High School & Beyond/Sophomores (HSB/So), which was scheduled to graduate from high school in 1982. In both cases, the students were — and remain — anonymous to all but the contractor responsible for gathering and preparing a standardized computer file of the records. The postsecondary transcripts for both cohorts were gathered 11 or 12 years after high school graduation. That time span results in very rich data. However elaborate the tapestry presented in the *Map*, this volume only begins to describe the patterns in these data archives. In the "Conclusion," some suggestions are offered for exploring the data in more depth. A new cohort of students from the National Education Longitudinal Study of 1988 (NELS-88), who were scheduled to graduate from high school in 1992, is still being followed, and we hope to gather its postsecondary transcripts in 2001. With that addition, we will be able to trace three decades of change in what college students study and where they study it.

Transcripts are unobtrusive records. As such, they do not lie, they do not exaggerate, and they do not forget. They tell us what really happens, what courses students really take, the credits and grades they really earn, the degrees they really finish and when those degrees are awarded. When these documents are part of the histories of thousands of individuals first selected in high school and followed for 10, 12 or 15 years, they become the most powerful national evidence we have for answering commonly-asked questions about what happens over a long period of time to people who continue their education after high school, as most students now do.

The 1995 version of *The New College Course Map* was necessary because of the limitations of its out-of-print 1990 predecessor. The 1990 account was based wholly on the NLS-72, hence reflected curricula and student experiences in higher education in the years 1972-1984. The most frequent comment we received on the document was "That's very useful information, but things have changed. How is it different today?"

With the addition of the HSB/So transcript sample covering the period 1981-1993, we could answer the question — along with a host of other commonly-asked questions about how we are doing in postsecondary education. The essays for each of the sections in this book provide "pointers," offering the reader both selected highlights of the data and suggesting ways to explore the findings further. Here are some excerpts from those "Pointers," underscoring changes in curriculum, attainment, and student demography.

Curriculum Experienced by Students

- While the college curriculum experienced by students became more quantitative, and in disciplines ranging from geography to criminal justice, the study of core laboratory science declined markedly during the 1980s.

- The study of business and business-related fields now dominates postsecondary education. Even in non-business fields such as music and communications, we see measurable student course-taking in "The Business of X." When this happens, students take fewer courses in other fields. Among noted areas of decline were education, life sciences, agriculture, and ethnic studies.

- Business was not the only growth field between 1972 and 1993. Computer science and related engineering and engineering technologies fields also expanded significantly, as did women's studies and mass communications. The expansion of the leisure and health club industries is also reflected in increased student participation in course categories involving tourism, marketing and operations of the hospitality industry, and recreation.

- When academic fields grow in the "delivered curriculum," that is, what students actually study, they undergo what we might call "internal differentiation." It is thus possible to describe their curricula in greater detail. Taking the evidence from transcripts, new fields and sub-fields have arisen in communications, computer science, engineering technologies, and nursing.

- Other fields seem to have undergone internal restructuring, e.g. office support occupations, marketing and distribution, health services/medical technologies, and geography.

- There is a bi-modal pattern in the study of mathematics in higher education. On the one hand, there is more remedial work going on in math. On the other, more students are studying math at higher levels, partly as a by-product of requirements for business degrees, and an increased emphasis on quantitative methods in business-related programs.

- Higher education has placed a considerable emphasis on developing writing and communication skills. Since the 1970s, new course categories have evolved in the taxonomy to account for the volume of student course-taking. As in mathematics, while the proportion of students taking remedial courses increased, so did the proportion in other and"advanced" writing and communication courses

- Overall, the proportion of students taking remedial courses (English, pre-collegiate math, and basic study skills) has remained constant at 46 percent of everyone who earned more than 10 credits. But those students who take remedial courses are earning more credits (hence, spending more time) in the courses, whether or not those credits count toward degrees. The data suggest that colleges should be working more with disadvantaged students while they are still in secondary school, and, if possible, earlier.

- The "empirical core curriculum" remained remarkably stable over the period 1972-1993. Of the 30 courses accounting for the highest percentage of credits earned by bachelor's degree recipients, 25 were the same for both the 1972-84 and 1982-93 cohorts. Differences in the empirical core by race/ethnicity are slight.

- Potential school teachers spend roughly 30 percent of their undergraduate time in education courses, and 25 percent in courses in the principal content areas covered in k-12 curricula.

Student Attainment and Achievement

- Participation in postsecondary education expanded considerably during the period 1972-1993, but the rate of completing any credentials by age 30 did not increase. The proportion of students for whom a certificate was the highest credential earned nearly doubled (to about 9 percent) during this period.

- Of all students entering postsecondary education and earning more than 10 credits, that is, "making a go of it," the rate of bachelor's degree completion by age 30 declined from 48.3 percent for the generation that started in the early and mid 1970s to 44.5 percent for the generation that started a decade later. Of students who attended a 4-year college at any time and earned more than 10 credits, the bachelor's degree completion rate held at 65 percent.

- While enrollments in graduate and professional school may have increased, the rate at which bachelor's degree recipients entered graduate or professional school — at least by age 30 — declined during the late 1980s/early 1990s.

- The average time it took people to earn bachelor's degrees by age 30 increased by 6 percent, from 4.51 to 4.72 calendar years. The standard deviation remained flat at about 1.55, meaning that roughly 1 out of 7 bachelor's degree recipients now takes more than 6.3 years to complete the degree. That is not a large percentage.

- The average number of credits earned by students receiving receiving bachelor's degrees increased 4.5 percent, from 129 to 135 credits, the equivalent of about one-half semester. This phenomenon is obviously related to increases in time-to-degree.

- There has been no grade inflation, if measured in both distribution of letter grades and grade point averages (GPAs). In fact, grades declined. The mean GPA for all students earning more than 10 credits went from 2.71 to 2.65, with the standard deviation rising. This relationship is not surprising given the overall increase in participation in higher education. For bachelor's degree recipients, the mean GPA declined from 2.94 to 2.88, with the standard deviation flat.

- The proportion of grades indicating Withdrawal, Incomplete, and No-Credit Repeat nearly doubled from the 1970s through the early 1990s. This increase was heavily concentrated in remedial courses and in mathematics below the level of calculus.

Demography and Student Majors

- Women became the majority of both participants and undergraduate degree-completers, confirming evidence from other sources of data. Judging from completed degrees, women increased their participation in growth fields such as business, computer science, and engineering at a far higher rate than did men, and have come to dominate psychology.

- Special efforts to recruit women and targeted minorities to applied science/technology fields such as computer science and engineering were very successful, even though engineering remains an extraordinarily gender-segmented field. However, the representation of women and minorities in core science fields fell. It also fell — and even more significantly — in education, health sciences/services, and (for targeted minorities) in social sciences, demonstrating that when the sum equals 100 percent, more of X means less of Y.

- The story of changes in minority degree completion and majors appears to be a complex one, with considerable differences by minority group. For example, while overall bachelor's degree completion rates were down, they rose for Latino students and were significantly down for black students. The proportion of black students receiving degrees in engineering almost quadrupled during this period, while that for Latinos was up modestly (and the Latino rate was higher than that for white students in both cohorts — 1972-84 and 1982-93).

- Trends in majors of students receiving associate's degrees from community colleges mirror changes at the bachelor's degree level. There was a marked decline in both general studies and health sciences degrees, and a corresponding increase in business, computer-related, and technology associate's degrees.

- The rate at which all students who began in community colleges also attended 4-year colleges remained stable at 26 percent, while the rate of genuine ("classic") transfer to a 4-year college declined slightly from 22 to 20 percent. For students who began in community college *and* earned more than 10 credits (i.e. non-incidental students) these rates were 31 percent and 29 to 27 percent respectively.

- The rate at which "classic transfer" students earned bachelor's degrees by age 30 remained stable at 71 percent — six points higher than the bachelor's degree completion rate for all students who attended 4-year colleges at any time.

These bullets present but a sample of the type of information included in *The New College Course Map*.

FOR A BRIEF DESCRIPTION OF HOW THIS 2ND (1999) EDITION DIFFERS FROM THE ORIGINAL (1995), SEE PAGE 3.

Acknowledgments

The author wishes to thank the following people for their assistance, support, encouragement, and just plain patience: C. Dennis Carroll, Director of the Postsecondary Studies Division of the National Center for Education Statistics (NCES), whose guidance and persistence are responsible for the wealth of information in these data; Paul Knepper of the Postsecondary Studies Division of NCES, who has carried forward *The College Course Map* system into other national data bases; and Nabeel Alsalam, former director of the annual production of *The Conditions of Education* and currently with the Congressional Budget Office, whose consultation in conceptualizing and programming the data bases used here continues to be unique and invaluable.

For special support of this project, the Office of Educational Research and Improvement wishes to thank

- The Planning and Evaluation Service, Office of the Undersecretary, U.S. Department of Education, and

- The Division of Science Resource Studies of the National Science Foundation.

Preface

What Is in This Book and How Does One Use It?

The New College Course Map and Transcript Files is principally a reference work.

It is designed for:

- higher education administrators, faculty, and institutional research officers;
- state higher education offices;
- national organizations concerned with education and training after high school;
- learned societies in the academic disciplines;
- human resource development personnel who are concerned with the quality of the workforce; and
- members of the press who write/report on education matters.

This revised version of the *Map* has six major sections.

Section 1. "Making the Map," describes how the data bases on which the taxonomy or courses and analyses of course-taking, credits, grades, degrees, etc. were constructed and edited. While the section is heavy on methodology and procedure, it is useful background when one reads a table and asks, "How did they get that?" For researchers who have a CD-ROM full of data staring at them, and are starting to program those data, this section provides some useful advice as to what to think about.

Section2. "Degrees, Majors, Credits, and Time," presents the long-term educational attainment of two cohorts of students, and is designed to demonstrate the power of the underlying data bases by answers to some of the most commonly asked questions in higher education, for example:

- What proportion of people entering college earn bachelor's degrees, how does this proportion differ by gender and race/ethnicity, and how have these proportions changed over the past two decades?

- For those who earn bachelor's degrees, how long does it take, and does it take any longer than it did 20 years ago?

- What proportion of community college students transfer to 4-year colleges and what is their degree completion rate?

There is a substantive reason for placing these tables first in the sequence: the changes they reveal condition all the phenomena subsequently described in this volume.

In many respects, **Section 3**, "The Changing Shape of Delivered Knowledge," is the core of the *Map*. It presents the taxonomy of courses in postsecondary education that was derived from the High School & Beyond/So transcript sample. It includes the titles most commonly used in each of over 1,000 course categories, and the "decision rules" used in coding courses to the taxonomy when over 2,500 institutions are represented. It also indicates the course categories in which enrollments declined so much over the past 20 years that the categories themselves are no longer viable (though some could revive at a later date), which categories have been revived, and which are new.

This taxonomy and its rules are of particular value to state systems and institutions that use the *Map* for purposes of tracking enrollment mix and for conducting institutional and system planning. The general reader can use the introduction to obtain a sense of what is at issue; institutional research officers and learned societies will want to read the entries.

Section 4 begins to move the focus from the course to the student as unit of analysis. The intermediary stage is that of student time, for which credits are proxy measures. The data in this section take all credits earned by the two cohorts of students and ask which courses accounted for the majority of those credits The answer to the question yields the empirical "core curriculum." Of continuing special interest is the curriculum pursued by education majors, those who receive teacher certification, and other potential school teachers. We include an account of the empirical core curriculum for this group, as well.

Section 5 keeps the student as the unit of analysis, and asks the following questions:

- What proportion of students studied X?

and

- How has this proportion changed over the past two decades?

There are two tables in this section, both of which compare two cohorts of students: those from the period, 1972-1984, and those from the slightly overlapping period of 1982-1993.

The first table splits the universe into two groups: everyone who earned more than 10 credits in postsecondary education, and everyone who earned bachelor's degrees (this second group is obviously included in the first as well), and answers the two basic questions for 900 course categories dominated by undergraduate enrollments.

The second table takes the 900 course categories, aggregates them into 99 super-categories, and answers the same question, this time by race/ethnicity and gender.

These tables enable users at individual institutions or in states to compare what their students are doing to changes in the national tapestry. The tables also provide commentators accurate data on topics such as trends in college-level remediation or foreign language study.

Section 6 provides yet another illustration of the power of the underlying data bases by answers to some of the most commonly asked questions about grades in higher education, for example:

- How much grade inflation has there been in postsecondary education?
- What courses do people fail at high rates?

The answers to these questions may surprise some readers. But the tables in this section are designed to provoke further investigation and use of the data. The tables do not pretend to provide full analyses; nor do they pretend to cover the entire gamut of questions one could ask of the data base. The purpose of the tables is to guide and suggest, not to delineate.

The **Conclusion** covers a variety of topics, including the current status of the public access version of the data bases, both of which are available on CD-ROM, the ways in which the data base for High School & Beyond is being prepared for third edition of the CD-ROM, the variables that are being added, and the analyses that will be possible. The Conclusion also suggests where the broad outlines of the map delineated in this volume are most likely to be rendered three-dimensional by deeper probing.

This **2nd Edition** of *The New College Course Map* both updates and corrects all tables to match the current status of NCES data bases, using weights and programs developed since 1995. In response to requests from users, it adds tables on degree-completion of 4-year college students (table 2.2), community college transfer students (table 2.7), the empirical core curriculum of bachelor's degree recipients by race/ethnicity (table 4.2), course-taking of potential school teachers (table 4.3), and the distribution of undergraduate grades by institutional type, control, and selectivity (table 6.2). This edition also eliminates a lengthy table on the distribution of course-taking by institutional type that readers of the 1st edition found unproductive, and an exploration of the ratio of earned to attempted degrees, by field, with which the author was never wholly satisfied.

SECTION 1:

Making the Map:

Principles and Process

What, specifically, do we study after high school? What knowledge is the Nation acquiring in colleges, community colleges, trade schools, and other postsecondary institutions? Answers to these basic questions are important in assessing the quality of our workforce and cultural life. Answers to these questions are important in advising individuals on how to prepare for the challenges of adulthood, for helping state higher education agencies monitor educational services to different populations, and for guiding the Nation in preparing for economic, political, and social challenges of the coming century.

The most accessible answers to these questions, unfortunately, are both too general to be very useful and too narrow in their sources. That is, the computers whirring with national data can answer the questions only with reference to degrees and credentials actually awarded and only in terms of the dominant field, or "major" of those credentials. The annual *Digest of Education Statistics* (see, e.g. Snyder, 1998) provides easily accessible information on how many Associate's degrees were awarded in Nursing or how many Bachelor's degrees in Accounting or how many Doctoral degrees in History. Such information is helpful but limited. It doesn't tell us, for example, how much science the Nurses studied or what kind of science it was, hence how well Nursing graduates are prepared to adapt to changes in biomedicine.

Nor does it tell us about all those students — 40 percent of those who continue their education after high school — who never earn a formal credential. What did they study? And how much? After all, they also enter the workforce and community life, and bring with them whatever knowledge they have acquired in postsecondary education. Did a large proportion of them study business subjects, for example? If so, what kind of business-accounting, marketing, finance, personnel? If we know the answers, we can judge better the resident knowledge in different sectors of our economy. And if national policy is designed to encourage people to complete degrees and credentials, knowledge of the curriculum pursued by non-completers is necessary for analysis and guidance.

To answer these questions requires detailed empirical data on the courses actually studied by students after high school. Those data are available only from transcripts generated by students as they pass through colleges, community colleges, trade schools, etc. Fortunately, there are a few national samples of postsecondary transcripts in existence that provide such detailed data. But the variety of course titles, departments of instruction, and allied data (credits, terms, grades) on those transcripts is infinite. Without a map of curriculum, without a system to describe those courses economically and with consistency, it is very difficult to negotiate the terrain and answer the questions. With such considerations in mind, the Office of Educational Research and Improvement of the U.S. Department of Education set out to develop a course taxonomy. The project began in 1988.

I. Origins of this Project

The initial purpose of this project was to arrive at a credible and empirically viable taxonomy of course categories with which to analyze the college transcripts of 12,599 students in the Postsecondary Education Transcript Sample (PETS) of the National Longitudinal Study of the High School Class of 1972 (NLS-72). The transcripts for this group were gathered in 1984, 12 years after high school graduation. The students were 30 or 31 years old at the time. The task of developing the taxonomy was carried out between 1988-1990, and the results were published as *A College Course Map* (Adelman, 1990).

The taxonomy in *A College Course Map* was subsequently used to code the next generation of college transcripts, those from the High School and Beyond/Sophomore Cohort (HSB/So). This cohort was established in 1980 as part of the High School and Beyond longitudinal study. The students were in the 10th grade at the time. Most were scheduled to graduate from high school in 1982.

The High School and Beyond study also included a cohort of seniors who graduated in 1980, and were followed through 1986. The National Center for Education Statistics decided to follow the sophomore group for a more extended period because it included high school drop-outs, some of whom returned to complete GEDs and attended college at later points in their careers.

Between February and August of 1993, some 17,600 transcripts for 9,881 students in this cohort were requested. The students were 28 or 29 years old at the time. The transcripts came from any school that the students said they had attended since 1980 (a small number of students were early high school graduates, and another group took courses for college credit while in high school). By the end of the collection period, 13,358 non-duplicative transcripts for 8,395 students were received.

The New College Course Map reflects course-taking between the years 1981 and 1993. It is a revision and up-date of the original in light of the changes evident in the High School and Beyond/So transcripts. The tables in Sections 4-6 of this volume demonstrate precisely how course-taking, grading, and credit distributions changed between the period 1972-1984 and 1982-1993. There are some very significant stories in these time-series data, and they are discussed in the introductions to those Sections.

II. Establishing the Initial Taxonomy

The NLS/72 postsecondary transcripts were collected in the summer and fall of 1984, and subsequently coded by temporary office workers using the 1981 version of *The Classification of Instructional Programs* (CIP). The CIP system, created by the National Center for Education Statistics, has served as the *de facto* national standard for reporting enrollments and credentials in postsecondary *programs* since 1981. The CIP system was revised in 1985, and again in 1990 (Hunt, Morgan, and Carpenter, 1991).

Programs are not courses, and the CIP taxonomy was not designed with transcript analysis in mind. Nonetheless, it had been used to code postsecondary transcripts in all the longitudinal studies sponsored by the National Center for Education Statistics. We thus inherited the basic CIP system and its transcript applications as a given.

It was determined that approximately 40 percent of the 485,000 instances of course-taking recorded in the NLS-72 transcript sample had not been coded accurately, and that the "miscoding" was as much a function of the CIP system as it was the result of limited technology and quality control in the coding process. Both the Commission on Workforce Quality of the U.S. Department of Labor and the National Science Foundation, reviewed this assessment and recognized the incredible potential of this database once it was cleaned. In 1989 and 1990, both agencies thus provided financial support for this project, and, in 1995, both the National Science Foundation and the U.S. Department of Education's Planning and Evaluation Service contributed critical support for the second iteration of the project.

Basic Order and Marching Orders

In 1989-1990, we undertook the recoding of the data base, including a reconstruction of the CIP system according to pre-established criteria and rules. In so doing, however, we chose to retain the basic order and structure of the CIP:

- six-digit codes for each course/program, the first two of which indicated a broad field.

- fifty broad fields, arranged in alphabetical order from Agribusiness to Visual and Performing Arts.

- the use of "99" as the last two digits of a six-digit code to designate either indeterminable, missing, or other entries.

- the use of "01" as the last two digits of a six-digit code to designate general treatments of the subject matter.

We made some obvious semantic adjustments for purposes of coding courses (as opposed to programs): for example, "01" usually designates introductory level courses in fields where distinctions between the general/introductory course and upper-level courses are made. But we kept this basic order and structure because it did the least violence to a system that was already familiar to college registrars, institutional research officers, state departments of higher education, and other users.

Initially, we focused recoding efforts on the nearly 25 percent of all instances of course-taking that were assigned to the various "99" ("Other") categories; and the various "01" ("General") codes in those disciplines for which there was more than one code. Our objective was to render the unknown, known; and the general, specific. In examining the original coding of the transcripts, an ancient truism was reinforced: the word "other" invites abuse. Any category governed by such a word too easily becomes a garbage pail into which difficult problems and indeterminate realities are dumped.

After these tasks had been completed, we branched out to the other categories. In all, we reviewed entries under 850 of the original 1,099 CIP codes, and reclassified entries under 720 of those. In the process, 400 course categories were deleted and 338 new categories created.

Deletions and Additions: The Empirical Criteria

We observed an *a priori* rule that no course category would be maintained in the taxonomy unless there was sufficient empirical evidence for doing so. Six-digit CIP code categories were thus deleted if (a) they were redundant or unnecessary in light of other categories and/or if course titles could be placed more accurately in another category, or (b) they produced fewer than 22 valid instances of course-taking (out of 485,000 in the NLS-72 transcript sample). The threshold of 22 was determined after the first round of recoding, and was based on mean enrollments minus one standard deviation across all CIP codes after removal of outlying cases.

There were three exceptions to the 22-case threshold rule: (a) courses in which the subject matter has a direct relationship to national security interests, for example, less commonly taught foreign languages; (b) courses in which the subject matter explicitly concerns the history and culture of major U.S. minority groups; and (c) categories that, if eliminated, would leave no logical place in the system for the subject matter.

As for new codes, the vast majority resulted from disaggregations of categories of major disciplines in which the existing CIP system offered only one code, including anthropology, economics, geography, history, political science, and sociology. Others resulted from reconfigurations of fields in which the existing system distorted the presentation of student course-taking: computer science, mathematics, biological sciences, or in fields for which we needed finer discrimination to accommodate special analyses, such as English, music, and physical education activities.

Traces of Consensus and the Taxonomy of Courses

While the taxonomy is empirically-driven, a framework for creating order from apparent chaos was necessary. The initial organizing principles for new categories created in the processes of disaggregation or reconfiguration were thus drawn from one or more of the following:

(a) where they existed, content specifications for Graduate Record subject examinations (see Oltman, 1982; Devore and McPeek, 1985).

(b) indices of sub-fields in the major journals of the disciplines.

(c) categories used in surveys by such organizations as the National Research Council, the Mathematical Sciences Education Board, and the Modern Language Association.

(d) statements on college curriculum by professional and accrediting bodies such as the American Chemical Society and the American Assembly of Collegiate Schools of Business.

(e) the empirical character of the database itself, for example, if there were 200 "Animal Behavior" titles that data entry people working for the Department's contractors had previously classified as "Zoology: Other," they were reassigned to a new and unique code.

(f) the advice of representatives of disciplinary associations who attended a series of open meetings conducted in 1989 by the National Center for Education Statistics to discuss revision of the CIP system for purposes of reporting degrees and program enrollments.

(g) the advice of 50 consultants, friendly advisers, and members of external faculty review teams.

The first postulate informing this effort was that any field leaves unobtrusive traces of consensus concerning its content, and that those traces are public evidence, carrying higher authority than the testimony of individuals. *De facto* national examinations constructed with the advice and consent of representatives of scholarly or professional organizations constitute one such collection of evidence; indices of the literature included in the major journals of those fields constitute another. To be sure, the indices reflect research and applications emphases, and thus are often too detailed to serve as a taxonomy of postsecondary instruction. However, the indices are very much like an official topographical map, providing three-dimensional information on existing and emerging sub-fields.

This map is obviously colored and shaded by instructional and curricular practice, and by student choice behavior. It is for this reason that we did not rely on college catalogues for the taxonomy, since catalogue entries are too often wish lists of what may or may not be offered in course schedules, and certainly do not tell us what was actually studied.

Our second postulate was to be fair to the empirical character of a database that reflected the curriculum of the period, 1972-1984. At the time, we said that it is likely that the course titles and categories of the following decade would look somewhat different, but that we would not know for certain until the 11-year postsecondary transcript sample for the "High School and Beyond/Sophomores" (class of 1982) had been gathered. One can make the same assertion today about the forthcoming collection of transcripts for the NELS-88 longitudinal study (class of 1992).

The Primacy of Subject

A taxonomy designed to produce a national tapestry is governed by the principle that subject matter takes precedence over department of instruction. A course in "The Neurological Bases of Behavior," for example, could be offered by a Biology Department, a Psychology Department, or some other unit. For purposes of this taxonomy, however, we have a single slot for neuroscience courses. It makes no sense to have more than one. Yes, a physiological psychology course will include major units on the neurological bases of behavior, but physiological psychology is a broader subject than neuroscience, and has a different slot in the taxonomy.

The exceptions to this principle are grounded in academic custom and usage, for example, "Criminal Procedure" taught in a law school is not the same course as "Criminal Procedure" taught in a police academy. "Avian Diseases" in a school of veterinary medicine is not the same course as "Poultry Diseases" in a school of agriculture. One could go on. Furthermore, the department of instruction is too often determined by the size, organizational complexity, and mission of an institution. In smaller institutions, fields such as sociology, anthropology, demography, and urban studies, are often combined in the same department. Large research universities have separate departments for all of these fields. Some community colleges have one department for all of "science." Institutional size, complexity, and mission are but tangentially related to the map of learning.

While there have been other multi-institutional college transcript samples (for the most noted recent cases, see Shaman, 1994; Ratcliff *et al*, 1995), they have been designed to yield models for evaluating curricular effectiveness or coherence in individual institutions. Their analytical frameworks lean heavily on the constructs of "clustering" and sequence in course-taking behavior, constructs that depend heavily on local rules, scheduling, departmental prerogatives, and outright circumstance. These efforts can be very helpful in local assessments, and can aid the search for the curricular paths that make the greatest positive impact on different kinds of college student learning — and that is their purpose; but they have limited value in national accounting.

From a national perspective, there are two other and related reasons for the primacy of subject matter, reasons that do not emerge in typical applications of transcript information in individual colleges or other postsecondary institutions:

(1) Providing information to policy-makers on the knowledge-content of work/manpower preparation.

That is, we want to estimate particular kinds of knowledge or skills that are being brought into the workforce by former students, whether they earned degrees or not. For example, we might like to know how many people have studied sign language as an estimate of the potential workforce for assisting the deaf. If we code the courses in different sections of the map (e.g. Audiology, Special Education, Health Services), we will never be able to make that estimate. In the *College Course Map* and in our decision rules, there is only one place for all course titles with the words "sign language," "AMESLAN" (American Sign Language), or "manual communication."

(2) Providing information to learned and professional societies on trends in topics studied in their fields.

Learned and professional societies such as the American Historical Association or the American Chemical Society are national (indeed, international) information systems. Through their conventions and publications they both monitor the extent to which new developments in their fields are being presented to future practitioners and influence the dissemination of knowledge in educational institutions. They thus play a critical role in maintaining the quality of postsecondary education. Data on specific subject matter are more important to these organizations than the department of instruction. To the extent to which differentiation in the presentation of analogous subject matter has evolved, for example, discrete mathematics in computer science versus mathematics programs, that difference, we found, is evident in transcript data, and the affected learned societies agree on the distinction.

The Process of Recoding

There was one data editor for the entire process, and for both the 1990 and 1995 versions. This strategy increases reliability (while introducing intra-coder bias) at the cost of timeliness. For the 1990 version of the *CCM*, the process worked roughly as follows. For each field in which substantial reconstruction was deemed necessary, a preliminary taxonomy was developed based on one or more of the unobtrusive traces of consensus. We then extracted from the transcript data all those courses (and their allied variables, such as institution, credits, student majors, etc.) that were originally assigned to codes in the field at issue. The courses were then recoded — if necessary — according to the tentative taxonomy, with decision rules developed in the process.

In the cases of 17 (out of 33) major groupings of academic or occupational training fields such as communications, biological sciences, and history, the tentative taxonomy, new codings, and decision rules were then presented to an external team of faculty from the field at issue. These faculty reviewed this work, and met together for a day to make suggestions for changing the taxonomy, to develop new decision rules, and to mark up computer print outs of all transcript entries in the field — with corrections according to the way they saw things. The editor then reviewed their recommendations, accepted (on average, and after discussion) 90 percent of them, and recoded the course files again.

For the 1990 version of the *CCM*, where questions remained, we checked a sample of college and community college catalogues using a microfiche collection from 1977-78. Approximately 20 major titles were subject to this supplementary review, including "Visual Communications," "Human Growth and Development," "Conflict Resolution," "Communication Law," "Modern English Grammar," "Group Dynamics," and "Personal and Social Adjustment." For example, in the case of "Human Growth and Development," course titles for the 1972-1984 period had been coded by the contractor under biological sciences, psychology, home economics, anthropology, and education. The catalogue review provided decision rules that eliminated anthropology and education as options, created a new course category under biological sciences, and provided guidance for placing the remaining titles. As for "Modern English Grammar," institutional type became a determinant of classification: in most 4-year institutions, it was a linguistics course; in most 2-year institutions, a remedial English course.

"Visual Communications" was an interesting case because no clear-cut pattern emerged from the catalogue search: the title was found in roughly equal proportions under advertising, fine arts, and design. The course was usually described as a general introduction to visual semiotics. It was thus given a new code as a general course in Arts, and with sufficient cases to justify the category.

In addition to the primary process of focusing on the course as the unit of analysis, we also used the student and the student record. For other purposes, for example, making sure that degrees, degree dates, dates of attendance, credits, etc. were accurate, the editor read through the complete records of all 12,599 students in the NLS/PETS. Under the NSF-sponsored portion of the project, an advisory panel examined the records of all students who earned Bachelor's degrees in the core science and engineering fields. In the process, one could easily spot miscodings of courses, since every record presents a distinct context and tone. For example, a course entitled, "Composition," might have been coded as "English Composition" or "Drawing" or "Music Theory." But the student record showed a major in Russian, no courses in fine arts, and the "Composition" course occurring in the third year of college. Such clues were sufficient for recoding the course under Russian language *for that student*. Over 4,000 titles were recoded by this method.

This process was not applied to every one of the 1,037 categories used to describe course-taking for the 1972-84 period. One doesn't need external review to sort geography courses by world area or music history courses by genre. The empirical character of the database drove the categories in such cases. In effect, the database disaggregated and sorted itself.

For the portion of the project sponsored by the National Science Foundation, the process was somewhat more elaborate in that the work of the faculty review teams was both advised and subsequently reviewed by a five-person advisory board and NSF personnel. The fields covered included agricultural sciences, computer science, engineering, engineering technologies, allied health sciences, clinical health sciences, biological sciences, physical sciences, and science technologies. Work on the mathematics section had been previously reviewed by the Mathematical Sciences Education Board, which sponsored a presentation of our analyses of mathematics course-taking in December of 1988.

The process for the first version of the *College Course Map* took more than two years. It might have continued, but there was a point of diminishing returns to this effort.

We did not pretend then, nor now, that the results are 100 percent accurate. There are course categories that are still troubling, but because we are not working with original transcript documents, rather with coded files, there was little we could do about them. Courses with generalized titles in marketing are a good example. It is difficult to know which of these titles are introductory marketing courses in a business administration program, and which were courses in merchandising operations. Guidelines utilizing student major and institutional type were established, with the understanding that these would be refined as we gained experience from subsequent national transcript samples.

The results of this editing were presented to the National Center for Education Statistics as a supplementary file for the National Longitudinal Study of the High School Class of 1972 (Adelman, 1992), and are included on the public release CD-ROM version of that dataset (NCES, 1994).

III. Principles and Nature of Revision: the High School and Beyond Transcript Sample.

In 1990, the *College Course Map* said that "we do not expect the final taxonomy for the 10-year postsecondary transcript sample of the High School and Beyond Sophomores (High School Class of 1982) to be precisely the same." The period turned out to be 11 years after scheduled high school graduation, hence even more comparable to the NLS-72 than we originally imagined. And now that the results from the High School and Beyond sample have been tallied, our expectations have been borne out.

To maintain consistency so that time-series data could be produced, the *CCM* taxonomy was used to code the High School and Beyond/So postsecondary transcripts. But the transcripts produced by those who were high school sophomores in 1980 were inevitably different from those produced by students who were high school seniors in the spring of 1972. Not all sophomores graduate from high school, whereas seniors do. Some of the sophomores (8 percent) wound up receiving high school equivalency certificates well after their expected dates of graduation. Other sophomores started taking courses in community colleges and other postsecondary institutions while they were still enrolled in high school.

It is thus not surprising that a higher proportion of the transcripts received for the HSB/So came from non-collegiate institutions than was the case for the NLS-72. Non-collegiate institutions include trade and career schools, vocational high schools that provide instruction to people who have earned high school diplomas along with those still working on diplomas, job training centers, and non-degree awarding Area Vocational-Technical Institutes (AVTIs) and hospital-based programs. These institutions are important from a national policy perspective if for no other reason than their inclusion in federal student financial aid programs under Title IV of the Higher Education Amendments. As the National Student Postsecondary Aid Study (NPSAS) surveys of 1987, 1990, 1993, and 1996 have shown, students attending these institutions consume a disproportionate share of Title IV funds, and tend to be more "non-traditional" in terms of ethnicity, age, dependency and socioeconomic status than those attending 2-year and 4-year colleges (Bryce and Schmitt, 1992; Choy and Premo, 1995; Fitzgerald *et al*, 1994; Horn and Berktold, 1998).

Some of the changes in the taxonomy reflect this more diffuse and less collegiate sample of transcripts. The first edition (1995) of *The New College Course Map* included a lengthy table of instances of course-taking by institutional type, and clearly demonstrated that some codes do not reflect college-level instruction. Users of the 1995 edition suggested that we eliminate this table; but the lesson of the table lingers: when one aggregates these codes into larger bins, the knowledge of what is truly postsecondary is a critical filter.

Continuity in the Taxonomy

Even though the *Classification of Instructional Programs* (CIP) was revised in 1990, the coding system for the *New College Course Map* is still based on the 1985 edition of the CIP. It is based on that edition because

- it was necessary to maintain consistency with the NLS-72 coding so that we could offer accurate time-series data;
- the truly major alterations in the 1990 CIP (lumping both business and office-support programs in the same category, and combining allied health, health services, and professional health programs in the same category) may have been appropriate for reporting degrees, but not appropriate for describing course-taking;
- some institutions had adopted the *CCM* as an official guide to tracking student course-taking behavior, and it would have been unfair to change the rules.

The *CCM* was given to the teams hired by the Department's contractor to enter data from the original High School and Beyond/So transcripts. The teams consisted of graduate students, who consulted weekly with the data editor. An automated system took keywords from the course titles, and limited the range of codes available for data entry. At that point, decision rules entered to narrow the range even further.

The result was a data base with more accuracy in course coding than its predecessor. Still, there were nearly 6,000 courses (out of 320,000) that could not be coded at all. Due to the emergence of new titles for which the existing taxonomy did not account, there were thousands of other cases in which titles were either placed in the "other" (99) bins, or scattered according to the principle of best guessing. An uncodable course title might read, "UC/IDIS." A course title coded for the "other" bin in computer science, for example, might read "Computer Science Seminar." The title is very generalized, does not fit any of the other categories, but at least tells you what field is at issue, and needs a home.

The process of review began with extracting all the titles (and accompanying information such as institution, institutional course number, credits, and grades) in the various "99" bins to see whether they could be placed in more determinate positions. It continued by looking at codes with fewer than 20 cases to determine whether the code was still viable. These procedures inevitably generate other inquiries. If, for example, there were many cases of women's history courses being classified as "History: Other," the phenomenon suggested that we should reexamine all courses coded under "Women's Studies." This inquiry, in turn, lead to the creation of four new codes in women's studies, and the gathering of titles from other parts of the data base under those codes.

The review process also paid particular attention to codes for remedial courses, and this focus resulted in a number of refinements in the taxonomy of writing and language skills courses.

including a new code for Advanced Composition (as opposed to Creative Writing), and a code to handle English and writing proficiency examinations. Likewise, a review of the mathematics codes resulted in the creation of a new code to handle Advanced Statistics, a number of refinements to the calculus codes, and the creation of a new code to designate those introductory courses in physics that included the words, "with calculus." In an ironic but revealing turn, it was the examination of remedial courses that opened up the taxonomy to a fuller and more accurate accounting of advanced mathematics.

Major Changes in the Taxonomy

Comparing the 1990 and 1995 editions of the *CCM*, we find 80 new or restored course categories, and 81 categories that were viable in the period 1972-1984 but not viable for the period 1982-1993. The net number of categories in the taxonomy, then, barely budged: 1,038.

The truly major changes occurred in office support courses, communications, computer science, nursing, law, liberal/general studies, women's studies, basic skills, student activities and service (a wholly new chapter of courses), and engineering technology. By "major" is meant fundamental reconceptualization of the representation of a field in the taxonomy. Thus, for example, the 1990 *CCM* had only three categories for law:

220101 Law [includes torts, contracts, labor law, international law, administrative law, trusts, wills, family law. . . .] that is, the standard law school curriculum.

220103 Legal Assisting, Research, Writing, Legal Bibliography, Para-Legal.

220199 Law: Other.

The new presentation of law in U.S. higher education looks somewhat different:

220101 Introduction to Law, Law and Society, Law and Politics, the Legal System.

220201 Core Law School Curriculum [torts, contracts, trusts, wills, estates, family law, agency, property, litigation, ...etc.]

220301 Legal Research and Writing, Legal Bibliography, (general) Paralegal.

220302 Law Office Management.

220401 Military Law.

220501 International/Comparative Law.

229999 Law: Other.

One could argue, for example, that there are more cases of "Torts" than International/ Comparative Law, therefore "Torts" deserves its own category. But few, if any students outside law schools take a course in "torts," whereas international and comparative law turned up as much in business and international studies programs as in law schools. The new taxonomy allows us to distinguish between the core law school curriculum and the most significant and empirically numerous cases of law-related studies in other contexts. This, too, may change with the next generation.

There are 49 aggregate "disciplinary" groupings inherited from the *Classification of Instructional Programs* (CIP). Seven of these are not "disciplines," rather constructs for collecting courses of a similar type, such as "Health-Related Activities." Another six groupings (personal services, industrial arts, general studies, library science, military science, and science technologies) are either a minor presence or so narrowly defined that it is nearly impossible to make data entry mistakes. While all 49 groupings were reviewed at one time or another in the editorial process, we conducted special reviews in 9 of the 36 remaining areas: architecture, communications, communications technologies, computer science, engineering, engineering technologies, allied health sciences/services, clinical health sciences/services, and mathematics. Some of these were chosen because of changes in the disciplines since 1980 (communications and computer science). Others were chosen because of ambiguities in course categories (architecture and communications technologies). Still others were chosen because of comments we had received from the field concerning the 1990 edition of the *CCM*. These nine categories accounted for nearly 20 percent of all courses in the data base.

The 1995 reviews were conducted in the same manner as those in 1990. Teams of faculty came in for a day to review the taxonomy, develop or refine decision rules, and to read through computer print-outs of student records in the fields at issue to determine whether errors in coding had been made. In addition, we convened a special review panel of registrars and institutional research officers to resolve ambiguities in matters of degrees, degree dates, and majors across the entire range of the transcript files.

IV. Problems Other than Course-Coding

As the proceedings of this "registrars' panel" reminded us, transcripts present a great deal of information that bears on the interpretation of course-taking. Corrections in course coding are easy compared to corrections or clarifications of other data on the transcripts, particularly grades, credits, and what we call "term type." "Term type" refers not merely to semesters, quarters, and trimesters, but also to cases of clock hours, credit-by-examination, transfer, study abroad, journal entries (that aren't really courses), and the usual "other" bin.

The NLS-72 transcript sample presented far fewer anomalies, missing data, and strange entries in these other categories than did the High School & Beyond/So sample. Out of 320,000 course entries in the HS& B/So, we had 9,000 outrightly missing grades, 2,000 grade entries where it wasn't clear whether the grades were missing or the student had dropped the course or never taken it, 6,000 recognizable grades accompanied by zero credits, 2,000 "funny grades"

(X, Z, L, G, SC, NX, Q), and 5,000 numerical grades that did not make sense in terms of any commonly understood scale (0-100 or 0-4).

After determining the data entry errors (credits in the grade field, grades in the credit field, grades in the course name field hence labelled missing in the grade field), the only way to resolve questions about these grades is to telephone the registrars or record keepers, and ask what they mean. As long as you are at it, you can ask questions about anomalies in credits and term types, ambiguities in course titles, strange entries for course titles, and so forth. During the summer of 1994, we contacted registrars and record keepers at over 700 of the 2,500 institutions represented in the HS&B/So sample. These discussions were recorded on paper. We learned an enormous amount about contemporary practices in U.S. higher education.

Among other things, what we learned enabled us to remove from the universe of "course-taking" nearly 20,000 entries that were either *de facto* duplicates (transfers, repeats, resolutions of incomplete grades) or not courses at all (journal entries, attitude grades). We learned about the convention of transcripts with pre-printed course entries used in proprietary trade schools for specific programs and the difficulty of determining whether a blank field following the course entry meant that the student never took the course or withdrew or that the course work was incomplete.

We also learned a great deal about the conventions of what gets credit, and what does not get credit. It is not obvious, and not consistent across all institutions. In some institutions, remedial courses receive no credit; in others, the credit is "non-additive," that is, it counts for determining a student's status, but not toward a degree; and in still others, remedial courses receive full credit. And what can be said for remedial courses can also be said for physical education courses, music performance courses, and courses taught in non-degree-granting institutions. It helps to know all of this when you are trying to determine what actually is taught and learned in U.S. higher education. The "learning" process leading up to the 1995 edition of the *CCM* took 16 months, a considerable improvement in timeliness.

The tables in Sections 4-6 reflect this learning. These tables do not include duplicate transfer courses or journal entries, but they do include all other courses listed on the transcripts.

What Did We Learn About College Transcripts?

There are a number of lessons to be gleaned from this process that bear upon the presentation of curricular information. Foremost among these, if we are to take student records seriously, are six major types of unintelligibility in course titles on the transcripts:

1) **Gibberish**. "UC/IDIS," "BANA," and "DN MT & PRO" are typical of such entries. There were over 1,100 cases of unclassifiable gibberish in the NLS/PETS (the 1972-1984 collection), and a similar number in the High School & Beyond sample (1982-1993). Try "KNOW A TOM-ID-CRIME-GOD" or "TEN BAD TAB TEN" on for size!

2) **Word Games**. "ZOOSEMIOTICS," "DOTS TO DINOSAURS," "TIME AFTER TIME" and "RAGS TO RICHES" are good examples. The first of these is probably an animal behavior course, but it could also be graphic design. The others are impossible. Such titles, often the products of professorial marketing, challenge the reader to engage in interpretive games.

3) **Fog.** The first title in #1 above might have also been presented as "University Course/Interdisciplinary Independent Study," a title that conveys very little information to the reader. Another variety of fog consistsof extremely generalized titles: "IDEAS AND PROBLEMS," "APPLIED EXPERIENCES," "CONTENT," and (yes) "GOOD BOOKS" — even "THE GOOD LIFE."

4) **Inaccessible Codes and Private Languages**. "CHEMISTRY 126" is typical of the former; "GREEN BOX WORKSHOP" is typical of the latter. Both are examples of institutional solipsism: they wall off information about student effort from potential employers, graduate schools, and even, years later, from students themselves.

5) **Inaccessible Abbreviations**. Any faculty member who has worked registration lines or any administrator in a large institution knows what "SPED" or "HPER" or "OB" or "A&P" mean. But the presentation of courses on transcripts should assume less experienced readers.

6) **Blanks**. There are credits, a grade, but no course title. A prominent variation is the appearance of the department's name, such as "Mathematics." This variation is like the "fog" category. We have no idea what kind of math is at issue. It could be anything from arithmetic to linear algebra.

How extensive is the unintelligibility resulting from such presentations? Excluding "inaccessible abbreviations" (a large category), one out of every eight course entries for the NLS/PETS. Half of these were in the "word game" genre, and were resolved at great expense of time. The rest wound up in the various bins marked "indeterminable" and "other." For the High School and Beyond sophomore cohort, our system of higher education record keeping showed some improvement: only one out of every twelve course entries was unintelligible.

Credit Practices

There are also unintelligibilities resulting from idiosyncratic institutional credit accounting systems. In the case of one distinguished research university each course has three credit components and weightings. The footnotes on the transcript explaining these components and their weightings require an advanced degree in psychoceramics to decipher. Another institution of similar stature uses 100 as its normal course-unit weighting, and spreads values for these weights from 25 to 350. One can always speculate that, for students who graduate from such elite schools, the transcripts that go to potential employers or graduate schools are superfluous documents. However, the student who transfers from these institutions to other universities could easily suffer from misinterpretation of the formulas and scales.

An analogous problem exists for those institutions that do not employ anything resembling a credit-system. When we telephoned registrars in 1994 to clarify ambiguities on transcripts from their institutions, we targeted all schools with "non-credit value systems" to determine how they translate their local ledgers for purposes of transfer or graduate school applications. At more than one of these institutions, there was no attempt to accommodate the national currency. When we asked one registrar, "Well, what do you say to the medical school admission officer who calls and asks how many credits of organic chemistry an applicant has studied?" The answer was: "We'll figure it out, and call you back tomorrow." Whatever one may think of the national credit currency system, this applicant to medical school deserves a better answer.

Grading Practices

The grade of "Z" appeared on transcripts from more than one institution in the High School & Beyond/So sample. Was it a substitute for an "F," indicating something lower than ordinary failure? Was it an indication the student slept through class? At one institution, we were told that "Z" meant the student had "zeed out," that is, disappeared. At another, we were told, instructors had options for students who disappeared from a course: either to give them an ordinary no-penalty withdrawal, a "Y" in this case, or to "zap" them with a penalty "Z."

"Z" was not the only letter grade for which there were multiple interpretations across the spectrum of U.S. higher education. "Y" meant everything from audit to no credit repeat. "K" yielded meanings ranging from drop to incomplete to "in process." Sometimes, a grade indicating "in process" was still on the transcript 10 years after being issued. Where grades were missing, or when "N," (none), "NG," (no grade) or "NR" (no record) appeared, we were sometimes told that the instructors had never submitted the grades, even though the student had received a degree four or five years ago. Unresolved incompletes (indicated by "IW" or "IX" or "Q" or "L") litter the landscape of symbolic judgments. Because they were left unresolved on the record, it often appears that a student earned a degree with fewer credits than the customary threshold for that degree.

These ambiguities in course titles, credit practices, and grades are not fair to students. Transcript records should be designed to communicate on behalf of the student, hence, the reader should be able to tell — without magic — what was studied at the time it was studied, how much it was worth, and how the student performed. A transcript should be an instrument of trust.

SECTION 2:

Degrees, Majors, Credits, and Time: The Postsecondary Attainments of Two Cohorts at Age 30

In the pages of this section, the reader will find the first transcript-based national time-series data on educational attainment after high school ever produced, revised in 1999 to reflect the current status of NCES data-bases. The reason for placing this information before the taxonomy of courses and the elaborate tables on course-taking that follow the taxonomy is quite simple: what students study, and how much of it, is a function of their overall attainment.

The two questions asked most often in U.S. higher education are:

- What percentage of people who go to college earn a bachelor's degree?

and

- How long does it take them to get it?

The virtue of national transcript samples embedded in longitudinal studies is that they can answer these questions with powerful empirical evidence. Students change schools (McCormick, 1997). Students often cross state lines when they change schools. Students move in and out of higher education over a long period of time (Horn, 1998). What we now call "non-continuous enrollment" appears to be commonplace (Hearn, 1992).

The tables in this section provide both revelations and parameters for answering the two basic questions. They provide time series data for national samples, comparing the 12-year histories of the High School Class of 1972 and the High School Class of 1982.

The two samples are different in some important respects that may account for some of the changes the tables in this section indicate. We should be reminded of the most basic difference: the sampling of the High School Class of 1972 took place in the spring semester of its senior year, whereas that for the Class of 1982 took place in the spring of its sophomore year.

In the High School & Beyond/So sample, then, there are high school drop-outs who, years later, took courses at trade schools or community colleges or Area Vocational-Technical Institutes (AVTIs). Some of these people completed high-school equivalency diplomas (principally GEDs); some did not. While it is not the function of this document to analyze these relationships, common sense says that the majority of high school drop-outs do not possess the same academic resources or attitudes toward persistence as those who reach their "senior spring" on schedule.

Taken as whole groups, one would thus expect students in the NLS-72 sample who entered postsecondary education to be more successful in terms of degree completion and academic performance than their counterparts from High School & Beyond.

There are many ways to control the comparison of the two generations. For purposes of this volume, which focuses wholly on the transcript data, I have chosen to confine the universes of comparison to those who earned more than 10 credits in postsecondary education over the entire period in question. This strategy enables one to exclude incidental students from analysis. In both the NLS-72 and HS&B/So postsecondary transcript samples, there are hundreds of students (representing tens of thousands) whose records consist either of nothing but withdrawals, incompletes, and failures or who take two or three courses and then disappear from education — at least through their 30th birthday (see Table 2.3).

Given this basic control, here is what we see in answer to the two basic questions:

	Class of 1972	Class of 1982
Of those who earned more than 10 credits, the proportion with bachelor's degrees (Table 2.1)	48.0%	44.5%
Of those who earned more than 10 credits and attended a 4-year college at any time, the proportion with bachelor's degrees (Table 2.2)	65.9%	64.6%
Of those who earned bachelor's degrees, mean time to degree in calendar years (Table 2.4)	4.51 years	4.74 years

Remember: these data bases give the students 11 or 12 years from the point of scheduled high school graduation to go to college and earn a degree. In both generations, approximately 90 percent of those who earned bachelor's degrees by age 30 (a benchmark that is not wholly accurate, but rhetorically convenient), did so within 6.5 years of high school graduation.

The tables in this section elaborate these observations, and provide some guidelines for future research and interpretation. Among their revelations are the following, all of which cry out for more detailed examination than these pages allow:

■ Conditioning all interpretations, a considerable rise (35 percent) in the number of people attending postsecondary institutions *and* earning more than 10 credits.

Thus, access to and participation in postsecondary education expanded dramatically in the roughly two decades (1972-1993) covered by the experience of the NLS-72 and HS&B/So cohorts. When the population participating in anything increases, it is not unnatural for average performance to decline and the distribution of results to become more disparate. This is another way of saying that the mean score should drop and the standard deviation should rise. The reader of the tables will notice this happening.

■ Also conditioning all interpretations, a complete inversion of gender representation in higher education. Unlike analyses by race/ethnicity or geography or socioeconomic status, analyses by gender can be viewed as a half-full/half-empty glass. Women became the majority of just about everything in postsecondary education by the early 1980s, and have only increased their percentages since then. Indeed, in the time-series comparisons, the reader will notice that the standard deviations for women in such matters as time-to-degree and undergraduate credits earned rose far more than did the standard deviations for men. This trend is in keeping with conventional statistical wisdom.

How does this phenomenon feed into the interpretation of the tables? For example, in Tables 2.1 and 2.2, a lower percentage of women than men continued their education after the bachelor's degree — and in both cohorts. Yet since women were 54 percent of the High School & Beyond group, the weighted numbers of those who attended graduate school were but slightly below those for men.

■ A rise in the proportion of bachelor's degree recipients who continued their education in either post-baccalaureate coursework or in formal graduate or first-professional programs: from 26.1 percent for the NLS-72 sample to 29.7 percent of the HS&B/So sample (though the latter figure is inflated by non-degree oriented coursework). While graduate and professional school enrollments and degrees conferred have risen, the rate of cohort participation by age 30 has not. Other data sources, particularly the National Postsecondary Student Aid Study (NPSAS), strongly suggest that the increase in post-baccalaureate enrollments is weighted toward a population over the age of 30 (Korb, Schantz and Zimbler, 1989).

■ Despite an increase in participation rate among black students from 7.9 percent to 9.1 percent of those who attended a 4-year college at any time and earned more than 10 credits, the bachelor's degree completion rate for this group dropped from 48.4 percent to 39.2 percent. At the same time, Latinos completion rates rose considerably (Table 2.2).

■ A rise in the proportion of incidental students (Table 2.3). One out of every seven students entering postsecondary education now earns 10 or fewer credits by age 30. However small the increase, it is troubling, yet a logical consequence of increased access and participa- tion rates. The data suggest that delayed entry to postsecondary education is a strong correlate of "incidental" attendance, but that that socioeconomic status is not a strong correlate.

- A stubborn rate of non-completion among those who earned 60 or more credits by age 30 (Table 2.3). Members of this group have demonstrated that they can do college-level work. Determining why they did not complete any credential would help improve both academic advisement and, ultimately, completion rates.

- Average time-to-degree for bachelor's degree recipients, long reputed to have risen dramatically, has risen modestly: from 4.54 calendar years to 4.74 years (Table 2.4). However, modest it may appear, and depending on particular circumstances, this rise in time to degree is costly to students, their families, and (if enrolled in public institutions) taxpayers.

- One of the important potential correlates of increased time to degree is the 4.9 percent increase in mean credits earned by bachelor's degree recipients (Table 2.4). The standard deviation also fell dramatically, suggesting that the increase in credits earned may be a powerful an explanatory vehicle for the increase in time. For an alternative explanation, see the introductory comments to the tables in Section 6.

- The dramatic growth in the proportion of students majoring in business and business-related fields (finance, marketing, retailing, etc.) affected all sub-groups participating in higher education (Table 2.5). The growth was particularly notable for women and minorities. The same dynamic increase can be noted for computer science. Both trends are derivatives of their times.

- More of X means less of Y when a glass is more-or-less finite. For example, if the proportion of women B.A.s who majored in business jumped from 9.4 percent in the NLS-72 to 22.4 percent in High School & Beyond, then the proportion of women who majored in other fields will fall. Likewise for black students who earned bachelor's degrees and majored in business: 16.2 percent to 24.8 percent. The field that took the biggest "hit" in both cases was education (Table 2.5).

- Efforts to recruit women and targeted minorities to majors in engineering and computer science were comparatively successful during the 1980s (Table 2.5). At the same time, however, the proportion of the same groups earning degrees in the physical sciences and health sciences/services fell (Table 2.5), suggesting that the recruitment into applied science and technology fields took place among those who were already disposed to major in science.

- Trends in the major fields of associate's degrees conferred (Table 2.6) reflect those at the bachelor's level, particularly in business, computer-related, and health sciences/services fields. There is far more of a science/technology "tone" in the associate's degree fields of the HS&B/So cohort than there was for the NLS-72. The true judgment of these trends, though, is dependent on a full postsecondary career analysis of community college students, most of whom do not earn associate's degrees, but use the institution for ad hoc labor market preparation purposes.

■ The bachelor's degree completion rate of "classic transfer students" is higher than that of students who began their postsecondary careers in 4-year colleges. A "classic transfer" involves more than mere attendance at both 2-year and 4-year colleges: it requires starting in a community college, staying there for at least an adjusted semester's worth of credits (more than 10), and subsequently accumulating at least an adjusted semester's worth of credits at a 4-year college. As table 2.7 shows, the proportion of non-incidental community college students who transferred in this "classic" manner declined slightly (from 28.6 percent to 27.1 percent) between the two cohorts. What all these trends suggest is that advisement and articulation for students who *do* transfer have helped maintain degree completion rates in the face of higher numbers, but that a greater proportion of community college students have something other than transfer in their plans.

Our reading of the transcript records suggests that attendance patterns involving community colleges, four-year institutions, and trade schools are far more complex in the HS&B sample than they were in the NLS-72. For an elaboration of these patterns, see Adelman, C., *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment* (U.S. Department of Education, 1999).

Abbreviations Used for "Highest Degree Earned"

Certif	Certificate
Assoc	Associate's Degree
Bach	Bachelor's Degree
Bach+ Some Grad	Student earned bachelor's degree and credits after the bachelor's, but did not complete graduate degree by age 30. Degree may be in process.
Mast	Master's Degree, including MBAs
First Prof/ Doct	Ph.D. (doctorate) or post-baccalaureate degree in medicine, dentistry, or law

Table 2.1. Highest Degree Earned by Students in the National Transcript Samples, Part 1

NLS-72 = High School Class of 1972 in 1984 (age 30)
HS&B/So = High School Class of 1982 in 1993 (age 29)

Universe: All students who earned more than 10 credits from any kind of postsecondary institution. Weighted Ns: NLS-72 (1.54M); HSB/So (2.08M).

	None	Certif	Assoc	Bach	Bach+ Some Grad	Mast	First Prof/ Doct	At Least Bach	% of ALL
All :									
NLS-72	37.4%	4.5%	10.1%	35.5%	4.0%	6.2%	2.3%	48.0%	----
HSB/So	36.3	8.8	10.4	31.3	6.7	4.6	1.9	44.5	----
Men:									
NLS-72	37.9	3.1	8.9	36.5	3.9	6.1	3.5	60.0	51.2%
HSB/So	37.4	7.8	8.8	32.3	6.5	4.5	2.8	46.1	46.2%
Women:									
NLS-72	36.8	6.0	11.4	34.6	4.0	6.3	0.9	45.8	48.8
HSB/So	35.3	9.8	11.8	30.4	6.9	4.7	1.2	43.2	53.8
White:									
NLS-72	34.9	4.5	10.3	37.4	4.1	6.5	2.3	50.3	87.2
HSB/So	32.6	8.9	10.5	33.7	7.4	5.1	1.9	48.1	80.1
Black:									
NLS-72	53.8	4.8	7.7	25.8	1.5	4.8	1.8	33.8	8.1
HSB/So	58.9	9.1	7.8	17.5	3.2	2.6	0.9	24.2	11.0
Latino:									
NLS-72	60.3	3.6	11.2	16.5	5.6	1.5	1.3	24.9	3.5
HSB/So	50.3	10.0	10.9	21.9	4.2	0.8	1.8	28.7	6.4
Asian:									
NLS-72	30.3	1.3	6.2	42.1	5.6	8.1	6.5	62.3	1.2
HSB/So	29.2	3.6	8.3	36.3	6.9	6.1	9.7	59.0	1.9

Notes: (1) Rows may not add to 100.0% due to rounding; (2) for standard errors of the estimates, see Appendix A. (3) Weighted Ns include students for whom transcripts were not received but whose records otherwise indicate postsecondary participation. **Source**: National Center for Education Statistics: National Longitudinal Study of the High School Class of 1972 and High School & Beyond/Sophomore Cohort.

Table 2.2–Highest Degree Earned by Students in the National Transcript Samples, Part 2

NLS-72 = High School Class of 1972 in 1984 (age 30)
HSB/So = High School Class of 1982 in 1993 (age 29)

Universe: All students who earned more than 10 credits ***and*** attended a 4-year college at any time. Weighted Ns: NLS-72 (1.11M); HSB/So (1.34M).

	None	Certif	Assoc	Bach	Bach+ Some Grad	Mast	First Prof/ Doct	At Least Bach	% of ALL
All:									
NLS-72	27.9%	1.2%	4.9%	48.7%	5.5%	8.6%	3.1%	65.9%	----
HSB/So	27.3	2.1	5.9	45.4	9.7	6.7	2.8	64.6	----
Men:									
NLS-72	28.4	0.8	4.3	48.4	5.2	8.2	4.8	66.6	52.8%
HSB/So	26.8	2.0	6.1	45.8	9.2	6.3	3.9	65.2	47.4%
Women:									
NLS-72	27.4	1.8	5.6	49.1	5.8	9.1	1.3	65.3	47.2
HSB/So	27.8	2.3	5.8	45.1	10.2	7.0	1.7	64.1	52.6
White:									
NLS-72	25.7	1.3	4.9	50.5	5.7	8.8	3.2	68.2	87.1
HSB/So	24.0	2.3	5.7	47.7	10.4	7.2	2.7	68.0	83.6
Black:									
NLS-72	45.8	1.3	4.6	36.8	2.1	6.9	2.6	48.4	7.9
HSB/So	56.2	0.6	4.0	28.3	5.2	4.2	1.5	39.2	9.1
Latino:									
NLS-72	47.8	----	7.3	29.1	9.8	2.7	2.3	43.9	2.3
HSB/So	27.8	5.7	12.7	40.9	7.9	1.6	3.4	53.8	4.1
Asian:									
NLS-72	15.6	----	4.0	54.5	7.3	10.5	7.8	80.1	1.3
HSB/So	16.8	----	6.5	46.7	8.9	7.9	12.5	76.0	2.2

Notes: (1) Rows may not add to 100.0% due to rounding; (2) for standard errors of the estimates, see Appendix A. **Sources**: National Center for Education Statistics: National Longitudinal Study of the High School Class of 1972 and High School & Beyond/ Sophomore Cohort.

Table 2.3--Incidental Students and Long-Term Non-Completers: The Beginnings of Two Portraits from the National Transcript Samples

NLS-72 = High School Class of 1972 in 1984 (age 30)
HS&B/So = High School Class of 1982 in 1993 (age 29)

Weighted NLS-72: 254,138 incidental students; 144,556 long-term
Numbers: HS&B/So: 362,704 incidental students; 203,853 long-term

	Incidental Students (Earned 0-10 Credits)		Non-Completers (60+ Credits, No Degree)	
	NLS-72	**HS&B/So**	**NLS-72**	**HS&B/So**
As a Percent of All	12.3%	14.9%	8.1%	8.1%
As a Percent of Students Who Earned No Degree	27.7	31.0	18.3	17.3
Delayed Entry by More than 18 months	46.0	47.9	13.6	10.4
Delayed Entry by More than 54 months	20.0	26.0	1.5	3.0
Still in School at Age 30	8.9	7.1	25.8	22.5
Race/Ethnicity				
White	81.4	68.7	80.4	71.3
Black	12.8	17.7	13.0	17.7
Hispanic	5.1	9.9	5.6	7.8
Asian	0.8	1.1	1.1	2.2
Gender				
Male	50.3	44.7	55.4	51.6
Female	49.7	55.3	44.6	48.4
SES Trichotomy				
Lowest Quartile	26.5	28.3	17.5	13.4
Middle Two Quartiles	54.2	55.6	46.5	46.0
Highest Quartile	19.3	16.1	36.0	40.6

Sources: National Center for Education Statistics: National Longitudinal Study of the High School Class of 1972 and High School & Beyond/Sophomore Cohort.

Table 2.4–Time to Bachelor's Degree and Average Undergraduate Credits Earned by Students in the National Transcript Samples

NLS-72 = High School Class of 1972 in 1984 (age 30)
HS&B/So = High School Class of 1982 in 1993 (age 29)

Universe: All students who earned bachelor's degrees Weighted Ns: NLS-72 (732,511) HS&B/So (825,183).

Metric: Time in elapsed calendar years. SD=standard deviation.

	Time-to-Degree				Average Total Undergrad. Credits			
	NLS-72	SD	HSB/So	SD	NLS-72	SD	HSB/So	SD
All	4.54	1.53	4.74	1.52	128.9	22.8	135.2	16.8
Men	4.64	1.59	4.84	1.50	130.3	23.0	135.8	16.9
Women	4.37	1.49	4.65	1.53	127.4	22.4	134.6	16.6
White	4.50	1.54	4.71	1.49	128.8	22.2	135.0	16.8
Black	4.59	1.58	4.93	1.57	131.9	26.6	135.7	16.2
Latino	5.21	1.69	5.23	1.89	133.3	28.1	137.8	14.9
Asian	4.55	1.35	4.74	1.50	128.0	23.0	137.7	18.5
Selected Major:								
Business	4.70	1.68	4.73	1.47	126.5	20.3	132.0	14.0
Education	4.43	1.47	5.06	1.75	129.8	21.2	138.8	18.7
Engineering	4.89	1.84	4.93	1.34	139.0	23.8	148.0	19.8
Humanities	4.60	1.52	4.50	1.48	127.3	23.4	129.7	16.0
Arts	4.53	1.33	4.53	1.12	130.0	28.2	136.2	18.1
Social Sci	4.44	1.42	4.60	1.50	124.7	18.1	129.9	14.8
Life Sciences	4.46	1.20	4.46	1.08	128.8	22.8	137.5	18.1
Health Sci & Services	4.73	1.53	5.04	1.76	133.8	28.2	143.3	21.1
Physical Sci	4.55	1.53	4.51	1.45	132.5	24.2	137.3	13.1

Sources: National Center for Education Statistics: National Longitudinal Study of the High School Class of 1972 and High School & Beyond/Sophomore Cohort.

Table 2.5--Bachelor's Degree Majors of Students in the National Transcript Samples

NLS = High School Class of 1972 in 1984 (age 30); HSB = High School Class of 1982 in 1993 (age 29)

Universe: All students who earned bachelor's degrees. Weighted N's: NLS-72: 732,511; HSB/SO: 825,183

	All		Men		Women	
	NLS	HSB	NLS	HSB	NLS	HSB
Business & Allied	17.5%	25.2%	24.6%	28.1%	9.4%	22.4%
Educ & Library Science	16.0	6.7	8.2	2.5	24.9	10.6
Engineering & Archit	6.2	9.0	10.9	16.9	0.9	1.8
Physical Sciences	3.0	2.6	4.4	3.9	1.5	1.4
Math & Comput Science	1.8	5.9	2.2	7.0	1.4	4.8
Life & Agric Sciences	8.4	5.8	10.7	5.8	5.7	5.9
Health Sci & Services	7.5	6.5	2.8	2.3	12.9	10.4
Humanities	6.0	6.3	4.1	5.0	8.2	7.4
Arts	4.8	4.7	2.9	3.9	6.9	5.3
Social Sciences	17.7	15.7	19.3	14.5	15.8	16.9
Applied Soc Sciences	8.9	10.5	7.2	8.4	10.9	12.4
Other	2.2	1.2	2.7	1.8	1.7	0.7
Percent of ALL	----	----	53.3	47.6	46.7	52.4

Notes: (1) Columns may not add to 100.0% due to rounding; (2) Applied Social Sciences includes such fields as communications, public administration, social work, and criminal justice.
Sources: National Center for Education Statistics: National Longitudinal Study of the High School Class of 1972 and High School & Beyond/Sophomore Cohort.

Table 2.5--Bachelor's Degree Majors of Students in the National Transcript Samples (Continued)

NLS=High School Class of 1972 in 1984 (age 30)
HSB=High School Class of 1982 in 1993 (age 29)

Universe: All students who earned bachelor's degrees. Weighted Ns: NLS-72: 732,511 HSB/SO: 825,183

	White		Black		Latino	
	NLS	HSB	NLS	HSB	NLS	HSB
Business & Allied	17.6%	25.7%	16.2%	24.8%	11.1%	18.6%
Education & Library Sci	15.8	7.0	21.7	6.1	15.6	6.4
Engineering & Archit	6.4	8.9	2.0	7.0	7.1	9.8
Physical Sciences	3.1	2.4	1.8	1.5	5.4	1.0
Math & Comp Sciences	1.7	5.8	2.0	7.0	0.4	5.4
Life & Agri Sciences	8.5	5.5	6.0	6.3	6.5	5.0
Health Sci & Services	7.5	6.7	7.2	6.6	6.8	5.3
Humanities	6.1	6.7	5.5	2.5	6.4	5.6
Arts	4.9	4.6	3.0	3.5	4.3	4.8
Social Sciences	17.2	15.6	23.3	16.2	24.2	19.7
Applied Soc Sciences	8.9	10.2	10.2	16.5	11.5	15.5
Other	2.4	1.2	1.1	2.2	0.9	3.0
Percent of All	91.0	87.3	5.6	6.0	1.8	3.2

Notes: (1) While Asian-Americans accounted for 1.8 percent of the bachelor's degrees in NLS-72 and 2.5 percent in HS&B/So, the numbers are too small and the standard errors too large for reporting in this table. (2) The row totals for "Percent of All" will not add to 100.0%.

Table 2.6--Associate's Degree Majors of Students in the National Transcript Samples

NLS-72 = High School Class of 1972 in 1984 (age 30)
HS&B/So = High School Class of 1982 in 1993 (age 29)

Universe: All students who earned associate's degrees (even if they also earned bachelor's degrees either before or after the associate's).
Weighted Ns: NLS-72: 234,745; HSB/So: 304,179

Note: All columns add to 100.0 percent.

	All		Men		Women	
	NLS	HSB	NLS	HSB	NLS	HSB
Business and Allied	9.8%	18.9%	12.9%	19.3%	6.8%	18.6%
Business Support	9.7	9.0	3.4	0.7	15.7	15.0
Engineering & Oth Tech	7.7	9.4	14.7	19.9	1.0	1.9
Science & Math	1.9	4.3	2.8	6.5	1.0	2.8
Computer Related	2.3	5.5	3.3	6.8	1.2	4.5
Health Sci & Services	15.0	11.7	3.5	3.1	26.0	17.8
General Studies/ Lib Arts & Sci	35.2	27.4	37.7	27.5	32.7	27.4
Arts/Applied Arts	3.2	4.1	2.7	4.6	3.7	3.6
Other	14.9	10.0	19.0	11.5	11.9	8.5
Percent of All	----	----	49.0	51.0	40.2	59.8

Sources: National Center for Education Statistics: National Longitudinal Study of the High School Class of 1972 and High School & Beyond/Sophomore Cohort.

Table 2.7–Community College Transfer Students and Their Degree Completion Rates

NLS-72: High School Class of 1972 in 1984 (age 30);
HS&B/So: High School Class of 1982 in 1993 (age 29)

Universe: All students whose first institution of attendance was a community college. Weighted Ns: NLS-72 (686k); HS&B/So(872k).

	NLS-72	HS&B/So
All:		
Earned 10 or fewer Credits from all institutions	27.5%	24.2%
Attended a 4-year college	26.1	26.7
Transferred to a 4-year college	21.7	19.8
Highest degree was:		
No Degree	60.6	62.0
Certificate	5.2	6.5
Associate's	17.5	16.6
Bachelor's	16.7	14.9
Earned >10 Creds from Comm Colls		
Attended a 4-year college	31.7	31.2
Highest degree was:		
No Degree	50.8	50.3
Certificate	5.7	8.0
Associate's	22.9	22.5
Bachelor's	20.6	19.2
Transferred to a 4-year college	28.6	27.1
Highest degree was:		
No degree	15.2	12.6
Certificate	1.0	1.7
Associate's	12.5	19.1
Bachelor's	71.3	70.8

Sources: National Center for Education Statistics: National Longitudinal Study of the High School Class of 1972 and High School & Beyond/Sophomore Cohort.

SECTION 3:

The Changing Shape of Delivered Knowledge

The taxonomy of the *CCM*, presented in this section, appears as a dry ledger: codes, numbers, titles, and occasional explanations and guides for those who would use it at local or state levels.

The taxonomy is long, sometimes tedious reading, and not for everybody.

What we learned in the course of two constructions of the taxonomy and in conversations with our faculty review teams is that this ledger possesses some of the dynamics of a language. The codes are signs. They represent at least a surface reality: something that was taught and labelled. The labels, like words, are aggregated into larger configurations. When the reality changes in thousands of courses in thousands of institutions, the labels change. When the labels change, so do the signs.

What changes is not knowledge itself, rather knowledge delivered; delivered in a specific kind of institution that we loosely call "the university," and delivered principally to undergraduate students. Some delivered knowledge works its way "down," from the research labs and professorial libraries through the graduate seminars to the undergraduate curriculum (Mueller, 1989; Holton, 1962). In national archives of unobtrusive college records, we do not know that this transformation has occurred until it turns up on paper. Nor do we sense how much internal differentiation and sub-specialization in a field has become institutionalized until undergraduate courses are offered that students actually take and complete. The process occurs first in research universities (see, e.g. Ben-David, 1977) from which it ripples into a wider range of institutions.

Other delivered knowledge works its way "up." That is, in an expanding universe, postsecondary education must work with what secondary education produces. While this relationship is not explored in this volume, it appears that changes in the high school curriculum and high school student course-taking in the 1980s may have an impact on the shape of undergraduate curriculum in the 1990s (Green, Dugoni, and Ingels, 1995). Unfortunately, we will not have the full evidence on these effects until after the turn of the century, when the long-term postsecondary records of the high school class of 1992 are gathered.

The signs that a particular type of knowledge was delivered can also fade, and not because the knowledge itself was faddish. Rather, new paradigms can arise, and knowledge can be recompartmentalized or segmented (Hopmann, 1991) much in the same way as jobs are reconfigured to meet changing circumstances of production and distribution. The point is that no taxonomy of this kind is forever.

Skimming Through the Taxonomy: What Do We See?

If we simply skim the 145 pages of the taxonomy and look for the bold signs indicating that a category was either suspended, deleted, modified, or new, and remember that what we see is empirically-driven, what patterns emerge, and what conclusions concerning the shape of delivered knowledge might we draw? Here are some examples (and the reader is invited to find others):

- There is considerable stability within the curricula of higher education. The categories we use to classify delivered knowledge change with the speed of serial history: slowly. Furthermore, many of the changes were not the result of enrollments or student participation rates as much as they were of rethinking the presentation of existing data.

- Fields that grew and differentiated in the past two decades,for example, computer science and communications, developed theory and research courses drawing substantial enrollments. It is as if theory and research confirm the new standing or maturity of the field.

- Growing fields discover their "gateway" courses for majors. For example, Experimental Psychology has been the gateway course for psychology majors for decades, and both the enrollment and participation data for psychology majors reinforce that fact. Psychology is a mature field. But if one looked at the enrollment and participation data for computer science courses in the NLS-72 sample, covering the years 1972-1984, no one category leaps out as the "gateway" course. Programming? No. That's the basic tool, much like calculus is to engineering. By the end of the 1980s, however, and as reflected in the various tables in this volume describing course-taking, it is obvious that Computer Organization/Structure/ Computer Architecture now plays the gateway role.

- Some growth and differentiation is a direct by-product of technological developments external to higher education. Telecommunications, laser electronics, and medical imaging are obvious examples in the taxonomy.

- Differentiation does not necessarily mean more enrollments or student participation or credit-generation. For example, we have new course categories in health assessment and safety and modifications to the expanding boundaries of other health and physical education-related courses. All of this, one might say, reflects the growth of health-consciousness and the health-club service industry in the 1980s. But when one looks at changes in student participation rates (section 5) in these areas, it seems that whoever was working in the health clubs in the late 1980s and early 1990s went to college 10 years earlier.

- Conversely, contraction in enrollments, credit-generation and student participation in a broad field does not necessarily translate into suspended course categories in the taxonomy. Biological sciences is a good example of this apparent paradox. If the benchmark, base-period data for a field are very strong (as they were for the biological sciences in the NLS-72 transcripts) the drop would have to be catastrophic before the taxonomy lost sub-fields. The declines in the biological sciences (see tables 2.5, 4.1, 5.1, and 5.2), while substantial, were not catastrophic.

- Nor does differentiation at the "upper end" of a discipline or training field mean that all is well. For example, under English/Letters, the taxonomy adds two new categories covering writing proficiency and advanced expository writing and an expansion of the boundaries for "Technical Writing." It should be heartening that students are reaching those levels in numbers sufficient to justify expanding the taxonomy. At the same time, though, the proportion of non-incidental students taking remedial English/writing courses increased from 25.7 percent to 29.3 percent (see Table 5.2).

- As fields contract, weak distinctions between borderline subjects (for example, Educational Psychology and School Psychology) disappear, and categories are merged. One can only speculate about the decline of *school* psychology.

- There has been a noticeable rise in the role of cooperative education and internships, enough so that separate course categories to track this mode of learning-in-context are now found in business, communications, engineering, protective services, recreation, and political science.

Changes affecting specific disciplines are discussed in the short introductions to those fields in which they occurred.

How to Read the Taxonomy

The major fields of the taxonomy are presented in the order of the CIP system we inherited. For each code, we list the major courses titles and topics covered by the code/category, describe (where it is not obvious) the governing concepts in cases of modified or new codes, add the decision rules (if any) used to determine precisely how a particular course entry on a transcript was coded, and indicate where allied titles were coded. These comments are also intended to help those in state system offices and institutions in adapting the *CCM* system to their own needs.

Five notations flag codes that have a different status in the 1995 *Map* than they did in the 1990 version:

NEW [Obvious]

MOD Substantially modified in scope and/or detail.

SUS Suspended, that is, there were not enough cases to justify using a separate code in this edition. Provided the evidence warrants it, these codes may be restored in a future edition. In some cases, we note where the titles were moved. Individual institutions and state systems can obviously use these codes to account for local circumstance.

RES Restored, that is, this code was suspended/deleted in the 1990 edition because it did not meet the threshold criterion, but it is back in this edition.

DEL Deleted. The category has proved unproductive or redundant and/or we were advised by faculty working in the discipline to drop it.

The reader will find that graduate and professional field codes (for example, in the health sciences/professions areas) are over-represented among those suspended or deleted. This development is inevitable in the case of a national cohort transcript sample that "closes out" by age 30.

The Taxonomy of Postsecondary Courses Based on the National Transcript Samples

AGRIBUSINESS AND AGRICULTURAL PRODUCTION (01)

CCM Code	
010101	Agricultural Business & Management: General; Agricultural Policy; Agriculture & Government
010102	Agricultural Business/Finance/Marketing
010103	Agricultural Economics, Econ. of Agric. Production
010104	Farm & Ranch Management/Business
010199	Agricultural Business, Management & Marketing: Other
010201	Agricultural Mechanics, Farm Mechanics, Agricultural Skills, Farm Shop
010202 SUS	Agricultural Electrification, Farm Electrical Systems, etc. [Titles moved to 010205]
010203 SUS	Agricultural Mechanics, Farm Shop [Titles moved to 010201]
010204	Agricultural Power Machinery, Field Equipment: Operations and Management, Mechanized Feed
010205	Agricultural Structures, Equipment, Facilities,Electrification, Farm Electrical Systems, Farm Power, Farm Machinery
010206	Agricultural Soil/Water Practices, Hydrology, Irrigation, Tillage "Hydrology" also can appear under Agricultural Engineering (140301), as does "Soil Mechanics." Student major was the key to the assignment.
010301	Agricultural Production and Supplies: General, Agricultural Chemicals, Farm Chemicals/Supplies
010302	Animal Production, Feed Lot Production, Poultry Production, Pasture/Forage Production, Live Animal Evaluation, Animal Agriculture, Meat Animal Evaluation

CCM Code	
010304	Crop/Cereal/Grain/Fruit/Pasture Production, Greenhouse Crop Production, Row Crops
010399 SUS	Agricultural Production: Other
010401 DEL	Agricultural Products/Processes/Evaluation
010503 SUS	Agricultural Supplies/Services
010507	Horse Handling & Care, Horse Training, Paddock Management, Horse Science
	But "Equestrian" in the title placed the course in 360111. So did "horsemanship."
010601	Plant Materials, Home Gardening, Organic Gardening, Plant Materials, Aboriculture, Woody Plants, Shrubs
010602 SUS	Aboriculture, Woody Plants, Shrubs [Titles moved to 010601]
010603	Ornamental Horticult, House Plants, Indoor Plants, Floriculture, Greenhouse Ornamental Plants,Herbaceous Ornamental Plants, Greenhouse Cut Flowers
010604 SUS	Greenhouse Operation
010605	Landscaping, Landscape Plants, Landscape Management, Planting Design
	For "landscape architecture" and "landscape design," see 040601.
010606 SUS	Nursery Operation
010607 SUS	Turf Management, Recreational Turf, Turfgrass, Lawns
019999	Agribusiness/Agricultural Production: Other; Agriculture Internship

AGRICULTURAL SCIENCES (02)

020101	Agricultural Sciences: Gen., Intro. to Agricult., Agriculture in Society, Science of Agriculture

CCM Code	
020201	Animal Sciences: General, Anatomy of Domestic Animals, Physiology of Domestic Animals, Animal Growth
	But titles such as "Vertebrate Physiology" or "Mammalian Physiology" were coded 260706.
020202	Animal Breeding/Reproduction/Genetics, Artificial Insemination, Sire Selection
020203	Animal Health, Farm/Range Animal Health/Diseases
	These were not veterinary medicine courses. Student major was the key to assignment. On the other hand, we found that "Large Animal Care" and "Small Animal Care" usually belonged in 182401. If the type of animal was indicated, e.g. poultry, the course was still placed here, and not under "Poultry" (020209).
020204	Animal Nutrition, Feeds, etc.
020206	Dairy
020208	Livestock (Beef, Sheep, Swine), Meat Animals
020209 SUS	Poultry [Titles moved to 010302]
020299	Animal Sciences: Other
020301	Food Sciences, Food Systems, Food Production Processes, Dairy/Meat/ Poultry Production Processes, Food Packaging Systems, Food Chemistry
	See note at 190502. Student major was the key to assigning the simple course title, "Food Sciences."
020401	Plant Sciences: General
	These are not botany courses. See titles in the 2603 series for botany.
020402	Agronomy, Crop Science, Seed Biology, Tree Fruit Science
020403	Horticultural Science, Horticultural Botany, Horticultural Production, Plant Propagation, Plant Nutrition

CCM Code	
020408	Plant Protection/Pest Management, Herbicides, Insecticides/Insect Control, Weed Control
	As a title, "parasitology," standing alone, is to be found under Biological Sciences, not here.
020409	Range Management, Range Lands, Grasslands
020499 SUS	Plant Sciences: Other
020501	Soil Sciences, Soil Conservation, Soil Pollution, Soil Chemistry/Physics, Soil Systems, Soil Fertility, Fertilizers, Fertilizers and Plant Nutrition, Soil Resources
	The taxonomy distinguishes between the agricultural science "soil conservation" and the environmentally-oriented "land/water conservation" (030201). "Soil Engineering"/"Soil & Water Engineering" were classified under 140301.
029999	Agricultural Sciences: Other

RENEWABLE NATURAL RESOURCES (03)

While general interdisciplinary courses in Environmental Studies (303001) and Environmental Sciences (303002) obviously have their own position in the taxonomy, the environmental field underwent a great deal of expansion and differentiation in the 1980s, and most of the new titles appear under specific sub-categories of the Renewable Natural Resources section. Environmental technologies and engineering, however, continue to appear in the series with codes beginning "14" and "15."

030101	Renewable Natural Resources: General, Energy and Natural Resources, Land and Water Resources, Energy and Environment
030201	Land/Water Use, Managmnt/Conservation, Soil Management, Water Resources, Water Rights, Water Pollution, Water Quality, Watershed Management
030202	Conservation: General, Conservation of Renewable Resources, Environmental Conservation

CCM Code	
030203	Resource Mgmnt & Regulation, Environmental Policy, Environmental Impact, Environmental Administration and Law, Environmental Service
030301	Fishing & Fisheries, Fish Culture, Fish Management, Fishery Biology
030401	Forestry Production: Gen/eral, Farm Forestry,Forest Products, Forest Utilization, Pulpwood
030405 DEL	Logging, Forest Harvesting. [Titles moved to 030401]
030501	Forestry & Related Sci: General, Intro. to Forest Resources, Conservation of Forest Resources
030502	Forestry Science, Dendrology, Forest Hydrology, Forest Soils, Forest Biometrics
030506	Forest Management, Silviculture
030509	Wood Science, Forest Mensuration, Tree Growth and Development, Forest Pathology
030599 DEL	Forestry & Related Sciences: Other
030601	Wildlife Management & Conservation
039999	Renewable Natural Resources: Other

ARCHITECTURE & ENVIRONMENTAL DESIGN (04)

For the 1995 update of the taxonomy, architecture and allied fields in engineering technologies were re-examined to produce clearer boundaries among the course categories.

040101	Architecture & Environmental Design: General, Intro; Architecture and Society, Architecture and Environment, Architecture and Human Behavior
040201 MOD	Architecture Theory, Architectural Design, Archit. Design Studio, Site Development, Architecture Practice, Housing Design, Architecture Methods, Professional Evaluation/Registration

This code covers most of the major course titles in the architectural curriculum beyond the introductory course (040101). "Architectural Structures" and other related titles are found under Architectural Engineering (140401). "Construction/Building Materials and Methods" are found under 150103 (a new code). Still other related titles are found in the Architectural Technologies (1501 series), Architectural Drafting (480102), and History of Architecture (500740).

CCM Code

040301 Community/Rural/Regional Planning/Development, Zoning, Land Use Planning/Development, Facilities Planning, Planning Policy

Specifically "urban" titles were moved to 040701.

040401 MOD Environmental Design/Systems, Energy Conscious Design, Barrier Free Environment, Environmental Design Technology/Problems

Student major — or the dominant texture of student program — must be the guide to titles using the word, "environment." Titles such as "Building Climatology" and "Building Environmental Controls" were coded 150101.

040501 Architectural Interior Design, Interior Design Theory/Techniques, Commercial Space, Renovation

These are neither home economics nor art history courses, though their titles may include words such as "color" and "light." For interior/home decorating, see 200505.

040601 Landscape Architecture, Open Space Design, Physical Landscapes, Landscape Construction, Site Design

040701 Urban Design/Development, Cityscape, Streetscape, Modern City, Urban Form

049999 Architecture & Environmental Design, Other

The few "Historic Preservation" titles are found here.

AREA & ETHNIC STUDIES (05)

CCM Code	
050101	African Studies "African Nationalism" was classified under Political Science as Comparative/3rd World Politics (451007), but "Pan-Africanism," a movement encompassing more than politics or the ideology of nationalism, was coded here.
050102	American Studies, American Civilization, American Character, American Utopias But "American Story" or "The Growth of American Civilization" and similar titles referring to general national development were treated as history surveys, hence under 450810. "American Popular Culture" was classified under an interdisciplinary category (300404).
050103	Asian Studies: General
050104	East Asian Studies
050105	East European Studies
050106	European Studies: General "European Civilization" or "Europe's Story" were treated under history (450829), not here. A more typical title for this category would be, "European Cooperation and Conflict."
050107	Latin American Studies
050108	Middle Eastern Studies
050109	Pacific Area Studies
050110	Russian and Slavic Studies
050111	Scandinavian Studies
050112	South Asian Studies
050113 SUS	Southeast Asian Studies

CCM Code

050114 Western European Studies

See comments under 050106. A typical title for this category would be, "The Future of the EEC."

050115 Canadian Studies

050199 Area Studies: Other

050201 Afro-American/Black Studies, Afro-American Culture/Folklore/Community Development/Dance/Social Thought/Family/Politics/Church/Heritage; Black Writers/Artists/Consciousness

These are either generalized titles, or titles applying to specific subject matter in which "Black" is used, and not "Afro-American." For example, "Afro-American Experience" was coded here because it is generalized; "Afro-Americans in the 19th Century" was coded under "Afro-American History" (450817). "Black Society" is found here, not under "Sociology of Minority Groups" (451103).

050202 Native American Studies/Folklore/History

But "Native American Languages" is 161001.

050203 Hispanic American Studies, Chicano Culture/Child/History, Hispanic Culture, Barrios, Mexican-American Culture, Puerto Rican Studies

"Hispanic Civilization" taught in Spanish Departments was coded under foreign languages; Puerto Rican history was coded under Latin American History (450833).

050204 SUS Islamic Studies, the Nations of Islam

The only titles found in the High School & Beyond transcript sample were either in Religion (hence,380202) or Middle-Eastern studies (050108).

050205 Jewish Studies

These are not courses in Religion, Theology, or Bible. Course titles with reference to Talmud, Torah, etc. were coded either 380205 or (if in theological seminaries) 390601.

CCM Code

050206	Asian-American Studies
050299	Ethnic Studies: Other; Cultural Studies, Cultural Minorities, Multicultural Studies, Cultural Diversity

> "Ethnic Groups," however, was classified under Sociology (see 451103).

BUSINESS & MANAGEMENT (06)

The coding of business and management courses was informed by analyses of the College Level Examination Program (CLEP) tests in business, accounting, and management fields, the statement of standards of the American Assembly of Collegiate Schools of Business (AACSB), and a variety of publications on curriculum from AACSB. One objective of the taxonomy is to clarify the distinctions among the six "core" fields of the business curriculum: management, accounting, finance, marketing, organizational behavior, and quantitative studies. In fact, the faculty who reviewed the first (1990) taxonomy would have been happy with those six categories plus a code for general business and a code for "other."

Revisions of the 1990 representation are slight. There are two new categories (Business & Society, Entrepreneurship/New Venture Management), and some refinements in the quantitative studies codes (0613) and Management Information Systems (061201).

CCM Code

060101 General Business, Principles of Business, American Business System, Fundamentals, Foundations, Intro to Business, Business Policy, Business Organization, Business Problems, the Modern Corporation and other general Business Administration titles.

> These titles are distinguished from Introduction to Management/ Principles of Management (060401). Business History is coded with economic history under 450804.

060102 Business Law, Legal Environment for Business, Law & Business, Business Transactions and the Law

> When taken in law schools, courses with titles such as "Corporation Law," "Commercial Transactions," etc. were coded 220201.

060103 NEW Business and Society, Social/Environmental Responsibility of business

060104 Business and Government, Regulation

CCM Code

060201 Introductory Accounting, Principles of Accounting, Accounting Systems

060202 Tax Accounting, Taxes

> But "taxation" or "taxes and estates" or "federal income tax" as courses taken in law schools were coded 220201.

060203 Intermediate Accounting, Advanced Accounting, Cost Accounting, Auditing, Financial Communications, CPA Review, Managerial Accounting, Fund Accounting

060301 Finance: Principles, Corporate, Capital Markets, Financial Management, Capital Management, Financial Decisionmaking, Financial Policy, Working Capital

> But specific references to "farm," "crop" or "agricultural" finance were coded 010102.

060302 Bank/Financial Institution Operations, Bank Management, Commercial Banking, Credit Operations

> These titles were distinguished from "Money and Banking" under Economics (450657) and from banking occupations titles in the 0702 series. Institutional type and major (where known) were used to distinguish among these titles. "Banking" courses titles in proprietary business schools, AVTIs, and community colleges are usually not finance courses, hence belong in the 07 series.

060303 Securities and Investments, Stocks, Bonds, Commodities, Futures, Arbitrage, Securities Analysis/Valuation, Options, Investment Management

060401 Management: General, Theory, Introduction to, Fundamentals of, Survey of, Business Organization & Management, Management Concepts, Management Games/Policy/Strategy

060403 Operations Management, Product Management, Logistics, Inventory Control, Production Management, Production Planning, Cost Control

> Some titles here had to be distinguished from those in Industrial Engineering. Manufacturing Management, for example, was coded 140702. Student major is the key to the assignment.

CCM Code	
060501	Business Economics, Managerial Economics, Economics of Business, Analysis of Business Conditions
060601	Personnel Management, Human Resource Development, Performance Appraisal and Promotion Systems, Compensation Administration, Supervisory Management, Human Relations in Business
	But "principles of supervision" titles that refer to teachers or schools were coded in the 1304 series; and the word, "labor," in the title placed it in 061101. "Supervisory training" and "supervisory technique" were coded 070401.
060701	Institutional Management, Hotel Management, Restaurant Management, Hospitality Management
060705	Transportation Management, Freight Mgmnt/Rates/Tariffs, Physical Distribution, Transport Economics
	Titles in "public transportation" were coded under Public Works, 440601; titles specifying aviation or airport management were coded 490104. "Traffic Management," was placed under 060403. "Traffic Operations" is a Police Academy course, hence 430140.
060801	Insurance & Risk Management, Principles of Insurance, Introduction to Insurance, Family Risk Management, Property/Casualty
	Titles specifying insurance marketing or sales were coded 081001.
060901	International Management, International Business, Multinational Corporations
	But "International Economics/Finance/Trade" titles were placed in 450652, and "International Marketing" in 080703.
061101	Labor/Industrial Relations, Collective Bargaining, Contract Arbitration, Labor-Management Relations, Unions and Management
061201 MOD	Management/Business/Accounting Information Systems, Business Systems Design/Development/Analysis, MIS and Computer Programming
	Without a specific reference to a business or management topic in the title, "Information Systems" was coded 110401. Unless one is careful,

this category attracts a great deal of "noise" in coding. "Records Management," for example, is 070705; "Office Information Systems" is 070701; "Computers in Business" is 110603; and "Business Information Processing" is 070301.

CCM Code

061301 Business Statistics

"Business & Economic Statistics" was coded here, but "Economic Statistics" (without the word, "Business," was coded 450641. "Business Math" was either 270901 or 270902.

061302 Operations Research, Decision Science/Analysis/Support Systems, Mathematical Decisionmaking, Optimization

The key word is "decision." But "Math for Business Decisions" was classified under Math (270902), not here. "Optimization" also appears under Engineering Math (147001), and student major/course pattern are keys to code assignment.

061303 Management Science, Business Research, QuantitativeMethods/Studies/Techniques, Administrative Science/Systems

061401 Marketing, Marketing Management, Introduction to Marketing, Distribution Channels, Marketing Theory, Channel Management, Marketing Strategy, Marketing Operations Management

The most difficult decisions involved courses in "general marketing" or "introduction to marketing" that might be coded in the 0807 series. The decision rule was that if the courses were *graduate* (i.e. taken in the course of an MBA program) or the student's undergraduate major (if known) was 0603 (finance), 0604 (management), 0613 (operations research/quantitative studies), 0614 (marketing), or 0615 (organizational behavior etc.), then the course was classified under 0614.

061402 Marketing Research, Behavioral Science in Marketing, Consumer-Marketing Behavior, Consumer Behavior

061501 Organizational Behavior/Theory/Processes, Organizational Development, Managerial Behavior, Administrative Behavior, Organizational Communications, Corporate Communications

One of the most vexing issues in the entire taxonomy involved the word, "communication," in titles referring to business, management, etc. The decision rule was to code "Business Communication" as 070703, and "Management Communication" as 091004, and the residual titles invoking "organization" or "corporation" here.

CCM Code

061701	Real Estate, Land Finance/Leasing, Appraisal

But "Real Estate Law" and "Real Property Law" were classified under Law (220201).

061801	Small Business Management/Policies/Operations, Proprietorship
063001	Internships in Business/Accounting, Co-Op: Management, Business Practicum
064001	Personal Finance

This is neither a personal service course nor a home economics/family finance title. The former would be classified under "Coping Skills" (370102) and would be less than a three-credit course; the latter would contain the word, "family."

066001 NEW	Entrepreneurship, New Venture Management, Venture Capital, New Business Ventures, Enterprise Development
069999	Business Administration: Indeterminate/Other

OFFICE SUPPORT OCCUPATIONS (07)

Student major and degree level (in combination) played a role in assignment of titles here. For example, "Banking" for an office occupations major with a certificate but no degree was assigned here, not in Business Administration (06) or Economics (4506). In looking at both new and suspended or deleted titles for 1995, the reader will be struck by the obvious change in the nature and processes of offices all over the country.

CCM Code

070101	Accounting & Bookkeeping Support: General
070102	Computer Accounting, Accounting Machines, Payroll, Clerical Accounting, Secretarial Accounting

Titles here do not refer to the study of accounting principles, rather to accounting operations.

CCM Code	
070103	Bookkeeping
070104	Machine Billing/Office Machines, Business Machines, Technical Business Lab, Calculating Machines
070199	Accounting & Bookkeeping Support: Other
070201	Banking & Related Financial Program Support, Teller Operations, Credit Procedures, Credit Union Operations
070299 DEL	Banking Occupations: Other
070301	Business Data/Information Processing.
	Without the word, "Business," data processing courses were coded as 110301.
070302	Business Computer Operation(s), Terminal Operations, Computer Peripheral Operations
070303	Business Data Entry Equip Operation, Keypunch, Sorter
070305	Business Data Programming
	This is not a computer science applications course: Fortran or COBOL "for Business" courses were classified under 110603.
070401	Office Supervision/Management, Supervisory Training, Supervisory Technique
	But "Supervisory Management" was coded 060601, and "Law Office Management" is 220302.
070501 SUS	Personnel & Training Programs
070601	Secretarial Programs: General, Secretarial Science, Secretarial Lab, Proofreading, Secretarial Procedures/Administration
070602	Court Reporting, Transcribing

CCM Code

070603 Executive Secretarial, Managerial Typing

We split "managerial" from "production" typing titles, placing the latter in 070702.

070604 Legal Secretarial

070605 Medical Secretarial, Medical Dictation/Typing/Machine Transcription

Titles here are distinguished from those in Medical Office Management (170505) and Medical Records Administration (180703).

070606 DEL Secretarial Practices/Procedures
[Merged with 070601]

070607 Stenography, Dictation, Gregg Method, Stenotype, Pitman Method, Short Hand

070699 Secretarial Programs: Other

070701 General Office Programs, Office Organization, Office Automation, Office Procedures, Office Systems, Office Information Systems

070702 Typing, Clerk-Typist, Production Typing, Speed and Accuracy, Advanced Typing

Most of the typing titles can be found here. Courses designed for personal (and not occupational) typing skills were placed in 320108 (see the rules at that entry).

070703 MOD Business Correspondence, Business Memos, Resumes, Business Communications

The addition of "Business Communications" to this code was a major expansion born of the ambiguity of course titles and practice. In a majority of the institutions contacted to explain what a course entitled, "Business Communications," covered, we were told that these were surveys of and training in various kinds of written documents used in the conduct of commerce. While there is no doubt some overlap with Technical/Business Writing (231101), and while some institutions cover verbal and quantitative communication under the umbrella of "business communication," when we asked registrars or deans whether this was a"business support" course or an English course, most responded the former. In those cases in which the course was classified as a writing course under English, we coded it 231101.

CCM Code

070704 SUS Duplicating Machine Operation, PhotoDuplication, Reprographics

070705 RES Filing, Clerking, Records Management, Indexing, Record Keeping

070707 Receptionist

070799 General Office Programs: Other

070801 Word Processing

070802 NEW Office Software other than word processing (e.g. Windows, Lotus and other spreadsheet programs, graphics and desktop publishing programs)

"Computer Graphics" was a problematic title. If the course was taken by an engineering or computer science major, it was coded under Computer Science (110704). But if it carried less than 3 semester credits, it was coded here. See comments on 110704.

070803 NEW Computer Keyboarding, Business Keyboard Applications

If "typing" is in the title with "keyboarding," then the courses was coded as either 070702 or 320108, depending on context.

070901 Business English, Punctuation

These titles are to be distinguished from "Business Writing" (231101), Business Speaking (231001), Business Correspondence/Communication (070703), and Business/Managerial/Professional Communication (091004). They are, by and large, remedial courses.

079999 Business Support: Other

SPECIALIZED MARKETING AND DISTRIBUTION (08)

With the exception of codes beginning, "0807," these are highly-focused occupational training courses. There is a residual confusion in some of the codes beginning with 0807 that was difficult to resolve without doing considerable violence to the existing system of the *Classification of Instructional Programs*. New codes here account for the business aspects of cosmetology programs and the burgeoning entertainment marketing business.

CCM Code	
080102	Fashion/Apparel Marketing, Fashion Merchandising
080103	Fashion Modeling, Make-Up, Cosmetics These are not cosmetology courses (see 120403).
080201 NEW	Beauty Salon Management/Sales, Cosmetology Business
080202	Display, Visual Merchandizing, Exhibit Design
080601	Food Marketing, Grocery Operations Includes convenience store, supermarket management, specialty foods trade, and so forth.
080702	Industrial Sales/Marketing, Customer Relations
080703	International Marketing
080704	Purchasing, Buying
080705	Retailing, Retail Operations
080706	Sales, Salesmanship, Sales Strategies
080708	Marketing/Distribution: General/Introduction, Promotional Marketing Courses with the title, "marketing," coded here had to be distinguished from those coded in the 0614 series. The principal determinant was the student's major, when known. If the student's major was in the 08 series then the course was placed here. Institutional type was also used as a guideline, e.g. "General Marketing" courses in AVTIs and proprietary business schools were coded here.

CCM Code	
080799	General Marketing: Other
080901	Hospitality & Recreation Marketing, Hotel Accounts, Restaurant Accounts These titles were distinguished from the "hotel management" titles in 060701. The concepts that govern this category are promotion and sales, not management and finance. Titles include hotel/motel services, recreational services/products,etc. Like many others in the 08 series, they are "product training" courses.
080906 NEW	Sports and Entertainment Marketing, Promotion, and Management, Concert Promotion, Recording Promotion But "Business of Music" and similar titles were classified under 500960.
081001	Insurance Marketing/Operations/Claims/Adjusting
081101	Transportation & Travel Marketing
081104	Tourism
081105	Travel Services Marketing, Travel Planning,Ticketing, Reservation Systems
081203	Auto Vehicles/Accessories Marketing
089999	Specialized Marketing/Distribution: Other

COMMUNICATIONS (09)

As a field in U.S. higher education, communications is a conglomerate. Its sources lie in a variety of disciplines, and the shape of its curriculum in any one institution reflects local history more than national consensus. In some cases, communications emerged from the speech and theater/drama sub-divisions of English departments to embrace film and television. In others, it grew from the work of political scientists and sociologists who studied public opinion, propaganda, and mass persuasion. In still other cases, local departments were enlarged programs of journalism. The 1990 coding of courses in this field focused on three borders: those with English, communications technologies, and film studies. The decision rules strengthened those borders, but did not resolve all ambiguities.

For the *New College Course Map*, we undertook a special review of the communications area that resulted in considerable refine- ments, for example, disaggregating journalism into four categories, aggregating all courses involving writing for any media (other than news writing) under one roof, distinguishing between communications theory and communications research, sharpening the distinction between advertising and public relations, and adding new codes in telecommunications, inter- cultural communication, and business/managerial communication.

CCM Code	
090101	Communications: General, Principles, Human Communication, Fundamentals/ Foundations of Communication/Speech, Communication in Society, Oral/Speech Communication, Effective Speech We reserved the "speech" courses in English (231001, 231002, and 232003) for titles that were specific to either advanced (Debate, Public Speaking, Oral Interpretation, Voice, Announcing etc.) or remedial topics (the phrase "basic oral communication" as opposed to "basic principles of communication" placed the course in the remedial series in English, 2320). Likewise, general titles such as "Communication Skills" were assigned to the 2320 series.
090201	Advertising, Copywriting, Commercials, Broadcast Copywriting, Product Promotion "Advertising graphics" was placed under Commercial Art (480203), "Advertising research" under "Communications Research" (90302), and "Marketing communication" under Public Relations (90501).
090301 MOD	Communications Theory, Rhetorical Theory, Semiotics and Semiotic Theory
090302 NEW	Communications Research, Research Methods, Media Research, Advertising Research, Audience Analysis, Interaction Process Analysis, Survey Design
090401	Journalism for Print Media: Reporting, Editing, Feature Writing, News Gathering, Editorial Writing, Copy-Editing, Lay-Out
090402 NEW	Magazine Writing, Editing, Lay-Out and Design
090403 NEW	Broadcast News, Radio/TV News/Newswriting, Newscasting, Electronic News, Broadcast News Production
090404 NEW	Photojournalism
090501	Public Relations, Marketing Communication, Media Planning, Special Events Promotion, Campaign Development

CCM Code

090601 MOD Writing (exclusive of journalism) for the Media, Script Writing, Screenwriting, Telecommunications Writing, Radio/TV/Film Writing

090701 Radio/TV: General, Directing, Production, Programming; Electronic Programming, Broadcast Technique, Introduction to Broadcasting, Production Theory, International Broadcasting, RTF (Radio/TV/Film) introductions

Courses covering explicitly technical aspects of radio/TV production or studio operations, were classified in the communications technology series (10), as were titles referring to FCC license preparation. "Announcing" courses were placed under Public Speaking: Voice, Diction (231002). At the recommendation of the faculty review group, all writing courses in this category were moved to 090601.

090702 NEW Broadcast Industry, Business of Radio/TV, Radio/TV Management

These are not so much generic "business" courses as "industry-specific" business courses. They deserve a separate category. Courses dealing with the "business" of motion pictures were coded under 500602.

090801 NEW Telecommunications Policy/Management/Programming, Communication Systems, Telecommunication Information Systems

090901 Mass Communications, Mass Media, Communication Systems, History of Mass Communication, Media Communication, Media Use, TV/Radio/Film in Society, Mass Persuasion

Basic survey courses in mass media. But "RTF"introductions were placed in 090701 and courses such as "Film as Communication," for example, were placed in 500601. The title, "Minor Media," does not refer to communications, rather to fine arts. We distinguished, too, between "mass persuasion" and "theory of persuasion" (090301).

090902 Public Opinion & Propaganda, Political Communication, Public Opinion Polls, Politics and the Media

In the 1990 *CCM*, some of these titles, particularly those that referred to elections, were classified under "Political Behavior" (451009). Under the principle of primacy of subject matter, we moved all such titles here.

090903 Communication Law, Ethics, Regulation, Freedom of Press and Speech, Communications and Government

If these courses were taken by students enrolled in Law School, they were classified under 229999, and not here. "Press and Society" was coded under Journalism (090401).

CCM Code

091001 Interpersonal/Small Group Communication, Personal Persuasion, Non-Verbal Communication, Group Discussion

> While most communication is "interpersonal," we distinguished between these titles and those under 090101, by their specificity. At the recommendation of the 1995 faculty review group, we also distinguished them from titles in the 0909 series by the criterion of reference to public contexts or mass media. "Persuasion" was placed here, but "Mass Persuasion" was classified 090902 and "Persuasive Speaking" was placed in 231001 (Public Speaking). "Group Dynamics" and "Interpersonal Relations" do not belong here, rather in 421601 and 350101 respectively (but seethe decision rules under those two entries).

091002 Interviewing

> Courses in "interviewing" are given in many departments, for example, psychology, social work, journalism. Unless the title specified a distinct disciplinary context, though, it was placed here.

091003 NEW Intercultural/Multicultural/Cross-Cultural Communication, Cultural Dimensions of Speech, Ethnic Communication Modes, Interracial Communication

> But general "Intergroup Relations" titles were coded under Social Psychology, 421601.

091004 NEW Professional Communication, Management /Executive Communication, Managerial Communication, Business and Professional Communication

> This is a very tricky territory. Titles such as "Organizational Communication" and "Corporate Communications" belong in 061501; "Business Communication" should be either 070703 or 231101, with student major and institutional type the determining factors. When the title combined "Business and Professional," it was placed here. "Job Communications," on the other hand, was coded 350102.

092001 Internships in Communication, Journalism

099999 Communications: Other, Indeterminable

COMMUNICATIONS TECHNOLOGIES (10)

Communications technologies cover courses in discrete production aspects of the media. They are not to be confused with any of the categories describing writing or directing for the media (see both the 09 and 5006 series). "Technical Communications" is not communications technologies, and was classified under 231101.

CCM Code	
100101	Educational Media Technology, Audio-Visual Communication, AV Equipment/Production/Materials If the title referred to "instruction" through educational media, it was coded as 130501.
100102	Motion Picture Technology, Super 8mm, 16mm technique, Studio Lighting, Film Projection But "Film Production," "Film Animation," "Film Techniques" and similar titles were coded under 500602.
100103	Photographic Technology, Camera Theory, Photo Sensitometry, Zone System, Photosensitive Materials, Reproduction Photography, Physics of Photography A title such as "The Physics of Light/Photog" was coded here, not under Physics.
100104	Radio/TV Production Technology, Broadcasting Technology, FCC License, Broadcast Operations, Cable TV Operations, Radio Engineering, TV Graphics, Studio Operations
100105	Sound Recording Technology, Sound Studio, Recording Systems, Art of Recording, Mechanics and Sound, Audio Reproduction Systems, Studio Recording Technique, Music Mixing
100109 NEW	Telecommunications Technology Fiber Optic Communications, Cable Communications, Cable Casting, Telecommunications Processes On the other hand, titles dealing with Telecommunications policy/economics/theory, etc.were coded under 090801.
100199	Communications Technologies.: Other

COMPUTER SCIENCE (11)

Courses with the word, "computer," in their titles are taught in a variety of departments and stress a wide range of competencies, from design to simple use. The principle used to guide the recoding of the entire NLS/PETS sample — that the topic of instruction takes precedence over the department of instruction -proved more difficult to apply in computer science and computer-related courses than elsewhere. But the identity of the institution in which the course was taught proved to be very helpful in refining the categories. In the 1990 edition of the *CCM* we added 12 to the 11 we inherited from the *Classification of Instructional Programs*. The new scheme was designed to identify more advanced courses in computer science (what the Conference Board of the Mathematical Sciences refers to as Level II and Level III Computer Science courses), to distinguish among the different types of programming and applications courses, and to sort out "computer literacy" and general use courses from the pack.

For the 1995 version of the *CCM*, we undertook a special review and revision of codes in the computer science area in light of the considerable growth, differentiation, and refinement of computer science during the 1980s and early 1990s. As the field refined its knowledge-delivery system, institutions of different types played more distinct roles. Hence, for example, in the new 1107 series (advanced computer topics), one will not find courses taught in less-than-2-year schools and rarely in 2-year colleges. For an analysis of change in the computer science curriculum during the period covered by both editions of the *CCM* see Adelman, C., *Leading, Concurrent, or Lagging?: the Knowledge Content of Computer Science in Higher Education and the Labor Market* (Washington, DC: U.S. Department of Education and the National Institute for Science Education, 1997).

CCM Code	
110101	Intro. to Computer Science, Computer Concepts, Computer Principles, Intro. to Digital Computers, Computer Science (with no other qualifiers),Computer Science with BASIC
110102	Computers and Society, Computers for Non-Technical, Computer Literacy, Exploring Computers, Computer Use, Personal Computing, Using Computers These courses are not really Computer Science, rather personal service or basic skills courses.
110201	Computer Programming, Programming in . . . (any major computer language, e.g. BASIC, PASCAL, COBOL, FORTRAN), Introduction to . . .(any major computer language), COBOL Applications, FORTRAN Applications, Flowcharting, Computer Problem-Solving

Applications courses are usually in the 1106 series. For the 1995 *CCM*, the faculty review team recommended placing applications courses tied to specific programming languages under 110201. Likewise, most titles including the word, "programming," for example, "Information Systems and Programming," were placed here.

CCM Code

110202 MOD Algorithms, Algorithmic Development/Methods, Algebraic Language Programming, Computer Logic, Digital Logic, Program Design

110203 MOD Machine Language, Assembler Language, Computer Organization/Structure, Computer/Machine Architecture

"Computer Organization" titles were moved into this category from their previous positions."Computer Architecture" courses are also taught under Computer Engineering (140901). Student major determines the code assignment here.

110204 Compiler Language, Grammar, Program Language Theory, Language Processing, Formal Language, Programming Systems, Program Languages

110301 Data Processing: General, Introduction; EDP; RPG (Report Program Generators), JCL (Job Control Language), File Processing

110302 MOD Data Structures, Discrete Structures

"Information Structures" titles were moved to the revised 110401.

110305 NEW Computer Networks, LANs, Data Communications, Distributive Processing

"Communication Systems," on the other hand, was not coded here, rather in either 141001, 150303, or 100199, depending on major. This is a case of a generalized title with multiple positions in the taxonomy.

110401 MOD Information Science, Information Systems/Structures, Information Networks, Data/Information Structures

110402 NEW Data Base Systems/Concepts/Management, File Organization/Design/ Structures, Information Storage and Retrieval

110501 MOD Systems Analysis, Systems Development/Design, Systems Organization, Computer Control Systems, Operating Systems, Systems Software/ Programming, Systems Architecture, Time Sharing

Some "design" and "architecture" titles were placed in Computer Engineering (140901), provided the courses were taught in 4-year colleges and student major was in engineering or engineering technologies. Deterministic Systems and Inventory Systems titles were placed in 141701, and Stochastic Systems in 147001. "Information Systems," of course, has its own code, 110401. While "Systems Programming" was placed here, "Programming Systems" was coded 110204.

CCM Code

110502 MOD Software Engineering, Software Development, Software Methods and Design,

Most of the courses in this category had been classified in 110501, but it is obvious that their emphasis on software engineering is qualitatively different. Likewise, all systems software courses that might be coded 140901 were moved here, even if the student was an engineering major.

110601 Computer Applications: General, Unspecified; Applied Micro, Software Applications

110602 Computer Applications: Science & Engineering, Medical Information Science, Basic Scientific Programming, Engineering Computing Methods, Computer Aided Design, CAD, Computer Based Design, Computers in Engineering, Fortran for Engineering, Biomedical Computer Applications

With the exception of a title such as "Computer Drafting Tech" (150202) CAD/CAM titles were placed here, not in Engineering or Engineering Technologies.

110603 Computer Applications: Business/Management/Accounting, Computers in/for Business, Data Processing with COBOL

Courses with titles such as "Business Computer Programming" or "Computer Programming: Business Orientation" were assigned to 070305, particularly if offered in 2-year colleges. "Management Information Systems" has its own code (061201), and the various categories in Management Science (the 0613 series) are detailed elsewhere. "Office Automation" courses were coded 070701, not here. "Business Data Processing" is 070301.

CCM Code	
110604	Computer Applications: Other Fields. The "other fields" ranged from architecture to linguistics to general social science.
110701 MOD	Simulation, Modelling, Parallel Processing This category covers some of the "Level III" subjects in the undergraduate surveys of the Mathematics Sciences Education Board.
110702 NEW	Analysis/Theory of Algorithms, Theory of Computation, Automata, Automata Theory, Graph Theory
110703 NEW	Artificial Intelligence, Computer Vision, Pattern Recognition, Expert Systems, Machine Learning
110704 NEW	Computer Graphics, Graphics Design If student major was in the fine arts (5007 series), design (5004 series), film (5006 series) or graphic communications (4802 series), titles such as these were considered applications courses and were coded 110604.
110801	Numerical Methods, Numerical Analysis, Linear Programming, Mathematical Programming This category was designed to capture second-level computer mathematics courses normally taught outside mathematics departments. Courses with titles such as "Computer Mathematics" or "Data Processing Math" were grouped with Finite and Discrete Math as *mathematics* courses (270202).
110901	Other Determinable Topics. The dominant titles here, however generalized, were Computer Lab, Computer Methods, Computer Problems, Computer Techniques, and so forth.
119999	Computer Science: Unknown or Indeterminable.

PERSONAL SERVICES (12)

The original (1979) version of the *Classification of Instructional Programs* attempted to cover every type of program offered in every sector of U.S. education. But the only sector that consistently uses the taxonomy in its national reporting is higher education; and there are dozens of CIP categories that yield no data on either courses or programs in colleges, community colleges, or vocational schools. Only four categories of the original 14 in this section were viable in terms of the NLS/PETS transcript sample. For the High School & Beyond transcript sample, three remained.

CCM Code

120301	Funeral Services, Embalming, Mortuary Management
120403	Cosmetology, Barbering, Hairstyling, Color Treatment, Physiology of Hair, Permanents, Manicure, Coloring, Facial

> Note that "Salon Management" and related titles involving sales, marketing, and state law were coded 080201. Transcripts from cosmetology schools often have entries for Charm, Poise, Personal Appearance, etc. If these were credit-bearing (they usually are not), they were coded 370104.

129999	Consumer/Personal Services: Other

EDUCATION (13)

Not all courses with the word, "Education," in their titles belong in the 13 series any more than all courses with the word, "Communication," in their titles belonged in the 09 series. For example, "Drug Abuse Education" is often a student personnel service course for college students, and was classified accordingly in the 34 series, particularly when the number of credits awarded was less than three. In many of these cases, we adopted the rule that "if the specialty is not a teacher certification category in at least a few states, the title probably does not refer to an education course."

In all the subject-matter education codes (1313 series), subject matter took precedence over level of education. Thus, "Elementary School Science" was classified as Science Education (131316), not Elementary Education. Likewise, a particular subject taught "for elementary/secondary school teachers" was classified under education, not under the subject, for example, "Chemistry for Teachers" is Science Education (131316), not Chemistry; and "Geography for Elementary Teachers" is Social Science Education (131318), not Geography.

For a number of reasons, 10 codes in the Education section failed to meet the threshold criteria for inclusion in the 1995 *CCM* and were either suspended, combined with other categories, or deleted. The percentage of Bachelor's degree recipients majoring in education dropped precipitously (from over 16 percent for the NLS-72 cohort to about 7 percent for the High School & Beyond/Sophomores), and the areas most affected were in special education and vocationally-related education. Fewer majors obviously means fewer cases of course-taking.

CCM Code	
130101	Education: General, Education and Society, Problems in Education, Foundations of Education Theory and Practice of Education, Issues in, Public School System, Education Policy But not "Social/Historical/Philosophical" Foundations. Those titles were placed under 130901.
130201	Bilingual/Crosscultural Education, Bilingual Child, Bilingualism, Multicultural Education
130301	Curriculum, Curriculum Theory, Applied Theory
130302	Instruction, Methods & Materials.: General, Creative Activities, Classroom Management, Classroom Discipline, Teaching Behavior, Listening/Learning Styles, Teaching Strategies, Teaching Process, Group Process in Education This is the basic classroom methods category. It was used when neither the level nor subject matter was specified. Thus, "Methods in Math Education" was classified under 131311, not here; likewise "Classroom Management in the Secondary School" was placed under 131205, but the general title, "Classroom Management" would fall here.
130401	Educational Administration: General, School Administration, Education & Law, Principalship, School Buildings and Grounds, School Finance
130404	Educational Supervision
130406 SUS	Higher Education Administration/Research, Community College Administration
130501	Educational Media, Instructional Media/Technology, Media for Elementary/Secondary Schools, Preparation/Use of Media/A-V Materials The category does not cover "Operation of A-V Equipment," or "Audio-Visual" without a specific reference to teachers or level of schooling. These other titles were placed in 100101.

CCM Code

130502 NEW Computers in the Classroom, Computer Education/Assisted Instruction

130601 Evaluation and Research in Education: General, Research Methods, Evaluation Techniques, Education Program Evaluation

130603 Educational Statistics

130604 Educational Testing, Measurement, Assessment,Individual Assessment

130699 Educational Research: Other

130801 Educational Psychology, Psychology of Learning, Human/Child Growth and Learning, Human Development and Learning, Learning Process, Learning in Schools

In the 1990 *CCM*, we split "school psychology" from educational psychology, and educational psychology from "developmental psychology" (420701) using the keyword, "learning." But the data driving the 1995 CCM failed to produce a threshold number of cases for "school psychology." For "Child Development," see comments under 200102. Courses on developmental theorists, for example, Piaget, were placed in 420701 unless there was an explicit reference to schools or schooling.

130802 SUS School Psychology

130901 Social/Historical/Philosophical Foundations (of Education), History and Philosophy of Education

131001 Special Education: General, Exceptional Child,Special Needs Child, Special Populations, Mainstreaming

131002 DEL Special Education: Culturally Disadvantaged

There were very few cases of this course in the 1990 *CCM* and none in the 1995 data.

131003 Special Education: Deaf/Hearing Impaired

These titles are distinct from those in the 1801 series in that they specifically refer to "Special Ed," "SPED," or similar abbreviations

CCM Code

131004 Special Education: Gifted & Talented, Creative Child

131005 Special Education: Emotionally Handicapped/Disturbed, Education for Autistic Children

131006 Special Education: Mentally Handicapped

131007 Special Education: Multiple Handicapped

> This category is also used for any Special Education title in which more than one disability is mentioned, e.g. "Education of EMR."

131008 SUS Special Education: Physically Handicapped

> All cases in the 1995 data base were either Adaptive Physical Education (171003) or allied health courses in the rehabilitation series (codes beginning with "1708").

131010 SUS Special Education: Remedial Education

> This category is like 131002, that is, the words, "Special Ed," are the key. "Remedial Reading" on the other hand, can be either a course in Reading Education (131315) or a basic skills course for underprepared college students (232002). But none of the cases considered for the 1995 taxonomy were Special Ed courses.

131011 Special Education: Learning Disabilities, Reading Disabilities

> The keywords are either "disability" applied to a cognitive process or "LD." If the title were "Corrective Reading," for example, it belonged in 131315, "Reading Education," not here.

131012 Special Education: Speech Correction

> This code was not for Speech Pathology courses (1801 series). Titles here refer either to "Special Ed" or "School" or "Classroom."

131099 Special Education: Other

CCM Code

131101 Student Counseling, Guidance, Educational and Vocational Guidance

> The word, "counseling," also appears in course titles under "Counseling Psychology" (420601), Social Work (440701), and various categories of the 1704 series (Human Services). Student major is a helpful guide to placing the title. The titles under 131101 should refer to *school* settings. "Vocational Guidance" is sometimes a personal service course in the 32 series (either 320105 or 320107). If a 1-credit course, we placed it there.

131102 Higher Education Student Personnel Services

131201 Teacher Education: Adult and Continuing Ed, Teaching Adults, Community Education

> We did not place the "agricultural education" extension course titles here, rather under 131301. "Parent Education," "Parental Involvement" and similar titles were coded as 200107.

131202 Teacher Education: Elementary Education, Activities for Elementary School, Books/Materials for Elementary School, Elementary School Program, Playground Activities

> Any subject matter "for Elem Teachers/School" title was placed under the 1313 (Subject Matter Education) series. There was one exception: titles referring to *more than one* subject, for example "Sci & Soc Sci for Elem" (a literal entry from the transcripts). Those titles were placed here. Titles referring to curriculum, materials, classroom management, activities, etc. without the keyword, "elementary," were placed in either 130301 or 130302.

131203 Teacher Education: Junior High/Middle School/Intermediate School

131204 Teacher Education: Early Childhood/Pre-Elementary, Pre-School, EC/ECE, Young Child, Montessori Methods, Kindergarten

> These designations supersede all other concepts attached to the title, for example, "Counseling the Young Child" was assigned here, and not to Counseling (131101). One exception involved titles referring to testing and measurement; the other, student teaching/practicum(131501). "Child Development" course titles, on the other hand, were placed in 200102.

CCM Code

131205 Teacher Education: Secondary Education

These are methods, theory, and materials courses with a specific level-of-education reference. Without the keyword, "secondary," these titles would be placed under either 130301 or 130302 (the general"Curriculum and Instruction") categories.

131206 NEW Higher Education Teaching, Instruction, Class Management, Teaching Assistantship (for graduate students only)

131299 DEL Teacher Education General Programs: Other, Indeterminable.

131301 SUS Agricultural Education, Agricultural Extension Education, Cooperative Extension [Titles moved to 131399]

131302 Art Education, School Arts & Crafts

131303 SUS Business/Marketing/Distributive Education, Teaching Typing, Teaching Shorthand [Titles moved to 131399]

131304 Driver and Safety Education

"Water Safety Instruction," however, was coded in 310401. And most "Safety and First Aid" titles, particularly those carrying less than 3 credits, were treated as Health Activities courses, and coded 340105.

131305 English Education, Teaching Literature, Teaching Writing/Rhetoric/Composition

"Children's Literature" titles do not belong here, rather with Language Arts (131323).

131306 Foreign Language Education

131307 Health/Nutrition Education, School Health Program, Foundations in Health & Phys Ed, HPE Activities in Elementary/Secondary School, Sex Education

If "Health" preceded "PE" in the HPE titles, they were placed here; if the converse, then in 131314. If "school" was not mentioned in conjunction with "Health Activities," the title was placed in the code series beginning with "34."

CCM Code

131308 SUS Home Economics Education

131309 DEL Industrial Arts Education, Teaching IA, School Shop
[Titles moved to 131320]

131311 Mathematics Education, Concepts of Math for Elementary Teachers, Math in the Elementary/Middle/Secondary School

> The key phrase for math education courses was"for teachers." However, course titles such as "Number Structures," "Number Systems," and "Math Structures," without any other qualification were classified 271001 with mathematics courses.

131312 Music Education, Music Pedagogy, Music in Schools, Music Fundamentals for Elementary Teachers, Keyboard Methods & Materials, Orff Method, Suzuki Method

> "Music Pedagogy" is not necessarily a course designed for teaching in *school* settings. Nonetheless, it is coded here under the "primacy of subject" principle.

131314 School Physical Education, Coaching, HPE in Schools, Motor Development, Basketball/Soccer/Gymnastics (and other sports) for Elem/JHS/Secondary Schools, Organization and Administration of HPE (but *not* HPER--see 171001), Teaching X (any specific sport or physical activity)

> This code applies to school-based physical education curricula, that is, courses to prepare physical education teachers for *schools*. We distinguished it from physical education for work in non-school settings, and from physical education courses that did not specifically reference a school context. These others are found either in the new HPER series (1710) or under the 31 series (Recreation). Neither "adaptive" nor "adapted" physical education titles were coded here. The former refers to training individuals to teach physical education to special populations (hence is coded under Allied Health); the latter involves physical education for college students who themselves require special arrangements, hence is coded under the 34 series.

131315 Reading Education, Diagnosis/Prescription in Reading, Corrective Reading, Basic Reading Instruction

CCM Code	
131316	Science Education, X (any specific science) for Teachers, Teaching X (any specific science) in Elementary/Junior High/Secondary school.
131318	Social Studies Education, History/Geography (and other social science subjects) for Elementary/Secondary Teachers, Social Studies in Elem School/Grades
131320	Vocational Education, Technical Education, Philosophy of Voc Ed, Organization of Voc Ed, Industrial Arts Education, Teaching IA
131322	Drama Education, Dance Education, Creative Movement for Children, Dance Activities Elementary, Play Production Secondary School, Teaching Theater
131323	Language Arts, Children's Literature, Literature for Adolescents, Reading and Language Arts, Story-telling, Teaching Handwriting/Spelling/Language Skills
	Titles with the word "Reading" were placed here only when found in combination with "Language Arts," "Children's Literature" etc. Some states have different certifications for reading teachers and language arts teachers, and our revision of the codes acknowledges that distinction.
131399	Teacher Education Subjects: Other, Indeterminable
131401	TESOL, English for Non-English Child, Theory/ Practice of ESL
	This category is distinguished from 232004, a category covering courses in English for native speakers of other languages.
131501	Student Teaching, Practicum, Directed Teaching,Field Placement, Observation & Participation, Supervised Teaching, Field Experience, Field Workshop, Internship, Supervised Teaching
	With the exception of student/directed teaching and field experiences in content areas, for example, "Student Teach: Art," all the above titles were placed here. "Student Teach: Elementary," for example, is to be found here, and not under Elementary Education.
139999	Education: Indeterminable, Other

ENGINEERING AND ENGINEERING TECHNOLOGIES (14 and 15)

The reassignment of course titles in engineering (the 14 series) and engineering technologies (the 15 series) departed in many ways from analogous tasks in other fields. Perhaps no other areas in the *Classification of Instructional Programs* illustrate better what the CIP was created to do: describe degree/credential programs, not courses. This is in the very nature of engineering and engineering technologies. Each sub-field is a composite, an interdiscipline that draws on many discrete courses from other areas of the college curriculum. And more than any other sections of the 1985 version of the CIP, the descriptions for each category in the 14 and 15 series truly delineate *programs*. Nonetheless, the CIP had been used to code courses, and, given that inheritance, our job was to make sure that the representation in engineering and engineering technologies fields was as accurate as possible.

The 14 and 15 series include many cases of parallel fields, for example, Civil Engineering (140801) and Civil Technologies (1502), Mechanical Engineering (141901) and Mechanical Design Technology (150805), and so forth. In these cases, decision rules were established for the assignment of courses based on the institution of instruction.

For the 1995 version of the *CCM*, we undertook a special review and revision of the engineering/engineering technology sections of the taxonomy. Refinements to both the codes and decision rules as to what goes where were considerable.

CCM Code

140101 MOD Introduction to Engineering, Engineering Design, Engineering Communication, Professional Orientation, Engineering Concepts, Engineering Science

> We decided to include these titles under the"Engineering: General" code (as opposed to the "Other/Indeterminable" code, 149999). “Engineering Design" courses are not necessarily introductory. In fact, some of them, with titles such as "Engin Design V," are clearly advanced courses.

140201 Aeronautical Engineering, Aerospace Engineering, Astronautical Engin, Aerospace System Design, Aeroelasticity, Aerodynamics

> If taught in universities with engineering programs, titles concerning Powerplant, Flight Mechanics, and Airframe were placed here. Otherwise, they were assigned to Aeronautical Technology (150801) or Aircraft Mechanics (470602) codes.

140301 Agricultural Engineering, Farm Power Engineering, Food Plant Engineering

CCM Code	
140401	Architectural Engineering, Architectural Structures, Beam and Column, Timber/Steel/Concrete Design If the student was a Civil Engineering major, "Structures" titles were coded 140801.
140501	Bioengineering, Biomedical Engineering
140701	Chemical Engineering, Biochemical Engineering, Electrochemical Engin., Fluid Flow Applications
140801	Civil Engineering, Highway Engineering, Hydraulic Engineering Structural Analysis, Site Engineering
140901	Computer Engineering, Systems Design, Digital Logic/Logic Design, Digital Computer Design/Theory, Digital Circuits, VSLI Design, Discrete Time Systems, Real Time Systems, Lumped-Parameter Systems Any title with the word "digital" placed the course here, as opposed to 141001. "Software Engineering" courses were coded 110502. For "Computer Architecture" and "Digital Logic" courses, student major or texture of transcript determined whether they were coded here or under Computer Science.
141001	Electrical Engineering, Electronics Engineering, Communications Engineering, Basic Electrical Circuits, Circuit Analysis/Design/Measurement/Theory, Log Pulse/Switch/Sequential Circuits, Analog Signals Courses with "AC" or "DC" or "Electricity" in the title were assigned to Electrical/Electronics Technology (150303), particularly if taught in 2-year colleges and/or if the student was not an engineering major. Course titles such as"Communication Theory" or "Pulse Measurement" evidently confused coders (they look like they belong somewhere else). Again, student major is the key. For "Solid State" titles, see 150305.
141101	Engineering Mechanics, Statics, Dynamics, Kinetics, Applied Mechanics, Mechanics/Strength of Materials, Rigid/Deformed Body Dynamics/Mechanics, Deformed Solids, Fracture Mechanics, Mechanical Properties of Materials The 1995 faculty review team decided to move all courses with the above titles into this category. However, Materials Engineering/Science courses, including "Properties of Materials," were coded 141801.

CCM Code

141201 MOD Engineering Physics, Applied Physics

> These are very mathematically-based courses. "Technical Physics" titles were moved to a new category, 151101.

141301 DEL Engineering Science

> On the recommendation of the faculty review group, the generalized titles in this category were moved to 140101.

141401 MOD Environmental Engineering, Environmental Health Engineering, Sanitary Engineering, Wastewater Engineering, Water Resources Engineering

> The expansion of coverage of this field is a by-product of reconstructing the 1506 series in Engineering Technologies.

141501 Geological Engineering, Geophysical Engineering, Geomechanics

141701 Industrial Engineering, Production Design, Human Factor Engineering, Time-and-Motion Study, Plant Layout, Facilities Design, Work Measurement, Operations Research, Engineering/Manufacturing Management

141702 Engineering Economics, Cost Engineering

141801 Materials Engineering, Materials Science, Properties and Structure of Materials, Composite Materials

141901 Mechanical Engineering, Heat Transfer, Engineering Thermodynamics, Automotive Engineering, Energy Conversion, Vibrations, Fluid Mechanics, Kinematics

> If the titles indicated sub-system applications, for example, "Fuel and Exhaust Systems," automotive courses were coded under Automotive Engineering Technology (150803).

142001 Metallurgical Engineering

142101 Mining and Mineral Engineering

142201 Naval Architecture, Marine Engineering, Ship Design

CCM Code

142301 Nuclear Engineering, Nuclear Energy Conversion, Reactor Theory/Design

142401 SUS Ocean Engineering, Coastal Engineering [Titles moved to 140801]

142501 Petroleum Engineering/Processing/Production, Secondary Recovery

142601 Surveying, Computer Mapping, Geodetic Surveying, Site Surveying

The placement of most courses here was dependent on the identity of the institution. Surveying courses offered in 2-year colleges were assigned to Surveying & Mapping Technologies (150203). Forest Surveying titles were assigned to Forestry Science (030502). "Mapping" and "Photogrammetry" courses were coded under cartography (450702).

142701 Systems Engineering, Engineering Systems Analysis, Dynamics of Systems, Engineering Systems Design

Systems Engineering is a distinct field, and the titles here are uncluttered by other adjectives.

145001 Engineering Graphics, Engineering Drawing

These titles were distinguished from those in the Drafting series (4801). However, "Engineering Drawing" taken by students who were not engineering or engineering tech majors was coded 480101.

147001 Engineering Mathematics, Engineering Statistics, Engineering Computations, Engineering Analysis, Optimization

These courses were not offered in mathematics departments, and were not classifiable in the terms of the Mathematics codes. "Calculus for Engineers" and similar titles, however, were coded under math (270601). "Optimization" is also found in business curricula (061302). Student major determines the coding.

148001 NEW Engineering Co-Op/Internship/Field Practice

149001 NEW Engineering Professional Practice Registration/Seminar/Evaluation

This category collects courses preparing students for the engineering licensure examination.

CCM Code

149999 Engineering: Other, Indeterminable

150101 MOD Architectural Design and Construction Technology, Building Technology, Construction Systems, Architectural Equipment, Building Environmental Systems, Building Layout

> This category included architecture and some civil engineering courses taught in 2-year colleges, including Building Environmental Systems and Site Development. "Architectural Communications" titles were moved to the Drafting series, and coded 480102.

150102 DEL Architectural Interior Design Technology

150103 NEW Materials and Methods of Construction, Architectural Construction, Introduction to Construction, Building Assembly, Concrete Technology, Foundations, Construction Procedures

150201 MOD Civil Technologies, Construction Cost Estimating, Contracts and Specifications, Construction Management, Construction Planning, Building and Construction Codes

150202 Drafting Technology, Electronic Drafting, Design Technology, Applied Design, Blueprint Reading, Model Making

> These titles are more distinct than those in the 4801 series. "Technical Illustration" titles were coded under the Graphics/Design series, 500403. "Blueprint Reading for Construction Trades" titles were moved to 460901. And basic drafting courses taught in less-then-2-year schools were coded under Industrial Arts, 210106.

150203 Surveying Technology, Surveying, Mapping Technol. Construction Surveying, Land Surveying, Topographic Drafting

150301 Computer Technology, Data Processing/Digital Hardware, Digital Electronics, Microtechnology, Microprocessors, Digital Circuits/Systems/Communication

150302 DEL Electrical Technology, DC and AC Applications

> On the recommendation of the 1995 faculty review group, this category was merged with 150303 below.

CCM Code

150303 MOD Electronic/Electrical Technology, AC Electronics, DC and AC Applications/Theory, Communications Electronics, Basic Electronic Theory, Microwave Technology, Diodes, Transistors, Active Devices, Radar, Electronic Measurements, Transformers,Capacitance

> "Basic Electricity" courses taught in both 2-year and less-than-2-year institutions were coded under industrial arts, 210104. Most "Electronic Devices" titles were offered by trade schools, and were placed in 470101. Most "Industrial Electronics" titles were assigned to 470105.

150304 RES Laser Electronics, Optical Electronics, Fibre Optics

150305 NEW Solid State Technology/Electronics/Circuits/Theory/Devices/Lab/Applications

150399 Electrical and Electronic Technologies: Other

150403 Electromechanical Technology, Electric Motor Controls, Automation, Mechanical/Auto Controls, Electrical Machinery/Motors, Servomechanisms

150404 Instrumentation Technology, Analytic Instruments, Instrument Mechanics, Electronic Instrumentation

150405 RES Robotics, Robotics Technology

> Some of these courses could be classified as Electrical Engineering (141001), but we kept all of them in one place least the significance of the growth of this field be masked in a more generalized category.

150501 Air Conditioning, Heating, Refrigeration, Solar Heating/Cooling Technologies, Hydronic Systems, Energy Conversion

> The context of a student record determines whether air conditioning and heating titles are coded here or in the 4702 series (repair).

150502 SUS Air Pollution and Control Technology [Titles moved to 150599]

150504 DEL Sanitation Technology, Sanitary Chemistry

> Some courses with these titles turned out to be about personal hygiene (340101) or restaurant/beauty salon operations, and were not engineering technology. Some were science technology courses (410101).

CCM Code

150506 Water and Wastewater Technology/Treatment, Treatment Plant Maintenance/Operations, Water Pollution Control, Solid Waste Processing, Waste Management, Wastewater Chemistry

But "Wastewater Engineering" was coded 141401, and general "Water Quality" titles are found in 030201.

150599 Environmental Control Technologies: Other

150603 Industrial Technology, Industrial Materials, Industrial Mechanics, Control Systems, Industrial Electronics

150604 Manufacturing Technology, Manufacturing Processes/Operations, Assembly, Materials Technology, Materials Testing, Manufact. Analysis, Numerical Controls

While "Numerical Controls" was moved to this category from 150403, note that "Statistical Process Controls" are in 150702.

150607 DEL Plastics Technology

Very few cases in either 1990 or 1995.

150610 Welding Technology, Welding Theory/Process, Welding Metallurgy

If taught in vocational/technical schools, or within automotive repair programs, most welding courses were classified under "Precision Metal Work" (480508).

150699 Industrial Production Technologies: Other

150701 MOD Industrial Safety, Safety Technology, Safety Engineering, Systems Safety, Hazardous Materials, Occupational Safety Management, Industrial Hygiene

For the 1995 version of the *CCM*, this category was reconstructed so as to focus more sharply on engineering technology topics, and away from courses that carried 1 credit or less for "safety information," whether personal, shop, or other occupational. These informational courses were usually coded 340105. But "Fire Protection Systems/Design/Management" titles were placed in the 4302 series.

CCM Code

150702 MOD Quality Control Technology, Quality Assurance Technology, Statistical Quality Control, Statistical Process Controls

> These titles were not placed under Industrial Engineering (141701) because the range of individuals and institutional types involved was far broader than a code usually reserved for engineering students in 4-year colleges would cover.

150801 Aeronautical Technology, Aircraft Systems

> But titles such as "Landing Gear," "Fluid Lines," "Engine Cooling," and so forth, when taken in 2-year or less-than-2-year schools by students studying aircraft maintenance were coded 470602.

150803 Automotive Technology, Fuel & Exhaust Systems, Drive Systems

> "Internal Combustion Engine" titles were placed here, not in Mechanical Engineering (141901). As in the case of 150801, titles referring to axles, ignition, auto air conditioning, etc. were coded under auto mechanics, 470604.

150805 Mechanical Design Technology, Analytic Mechanics, Power Mechanics, Machine Design/Processes, Tool Design, Mechanical Systems

150899 Mechanical and Related Technologies: Other

150901 SUS Mining Technology, Mine Management/Production, MineVentilation/Hydraulics [The very few cases here were moved to 159999]

150903 Petroleum Technology, Exploration, Well Logging

151001 DEL Construction Technology, Construction Lab, Construction Studio/Methods

> All titles were moved to either the new code for Architectural/ Construction Materials and Methods (150103), or the modified Architectural Design and Construction/Building Technology code (150101), or the new code for Construction Practices/Tools/Equipment (460901).

CCM Code	
151101 NEW	Technical Physics, Technology Physics, Physics with Applications
159001	Engineering Technologies: General, Introduction
159999	Engineering Technologies: Other, Indeterminable

LANGUAGES OTHER THAN ENGLISH (16)

The reconstruction of the foreign language codes for the 1990 version of the *CCM* was fairly simple and straightforward. Only one major governing principle was added: a distinction between elementary/intermediate levels of language instruction and advanced levels, including courses in literature, culture, and linguistics. For comments on coding literature in translation courses, see 230301.

In the 1990 version, all codes were maintained (unless there were zero enrollments), even if they did not meet the threshold criterion, under the *a priori* rule that subjects of particular concern to the national security community would be represented in our version of CIP regardless of enrollments. For the 1995 presentation, that requirement was modified because enrollments in some of the less-commonly-taught languages were so low that nothing was gained by distinguishing between introductory or intermediate and advanced presentations. Indeed, in other cases of the less-commonly-taught languages, our sample turned up no enrollments.

CCM Code	
160201 SUS	African Languages (Swahili, Wolof, etc.) [Titles moved to 169999]
160301	Chinese: Introductory and Intermediate Levels
160302	Japanese: Introductory and Intermediate Levels
160321	Chinese: Advanced, Literature
160322	Japanese: Advanced, Literature
160399 SUS	Other Asiatic Languages (Korean, Vietnamese, etc.) [Titles moved to 169999]
160402	Russian: Introductory and Intermediate Levels

CCM Code	
160403 SUS	Other Slavic Languages (Polish, Ukrainian, etc.) [Titles moved to 169999]
160422	Russian: Advanced, Literature
160501	German: Introductory and Intermediate Levels
160502	Scandinavian Languages: All
160503 SUS	Dutch [Titles moved to 169999]
160521	German: Advanced, Literature
	"Faust" would be coded here if the student's major and/or other patterns of coursework in German justified it. Without any prior German, it would be coded 230301. So would a title such as "TheFaustian Archetype."
160522 DEL	Scandinavian Languages: Advanced [Titles moved to 160502]
160601	Greek: Classical, Attic Prose/Drama
	But not "New Testament Greek" or Greek taught in theological seminaries — titles placed under Biblical Languages (390101). Most courses in Greek drama are in translation, and were coded 230201 (see comments for that entry).
160602 SUS	Greek: Modern [Titles moved to 169999]
160703 SUS	Indic Languages (Sanskrit, Urdu, Hindi, etc.) [Titles moved to 169999]
160901	French: Introductory and Intermediate Levels
160902	Italian: Introductory and Intermediate, Italian for Music
160903	Latin
	Not when taught in theological seminaries using Biblical texts (a fact that is usually clear in the course title). Those courses were coded under Biblical Languages, 390101.

CCM Code	
160904	Portuguese: All
160905	Spanish: Introductory and Intermediate Levels
160921	French: Advanced, Literature
160922	Italian: Advanced, Literature
160924 SUS	Portuguese: Advanced, Literature, Luso-Brazilian Literature [Titles moved to 160904]
160925	Spanish: Advanced, Literature, Golden Age, Generation of '98, Latin American Literature
160935	Spanish for Native Speakers
161001	Native American Languages
161101 MOD	Arabic: All
161102 MOD	Hebrew: All Not when taught in theological seminaries using Biblical Texts. See 390101.
161121 SUS	Arabic: Advanced, Literature [Titles moved to 161101]
161122 SUS	Hebrew: Advanced, Literature [Titles moved to 161102]
169999	Foreign Languages: Other, Indeterminable

ALLIED HEALTH (17)

In the 1990 *CCM*, there were three major additions to the area. The first, 170901, covers the generic introductory courses in Allied Health. A second, 172001, is a service course in Medical Terminology (which is also taken by secretaries working in doctors' offices and hospitals). And the third is the entire field of Health/Physical Education/Recreation, sometimes called (in the 1970s) "Movement Science and Leisure Studies." The courses in this field basically prepare one to enter the health/recreation club service industry and are to be distinguished from those that prepare one to be certified as a Physical Education teacher in schools (131314).

For the 1995 edition of the *CCM*, we re-examined coding in both the Allied Health (17) and Health Sciences-Services (18) areas in light of the fast changing shape of the health professions and health care administration during the 1980s. The result was a considerable consolidation of fields and the opening of new codes in the medical and diagnostic technologies areas. The 1995 faculty review group noted that the words, "clinical," "medical," "laboratory," and "technology," in course titles and *CCM* category titles were more confusing than enlightening. The consolidation should improve the clarity of coverage.

CCM Code

170101 Dental Assisting

170102 Dental Hygiene

170103 Dental Lab Technology, Dental Materials/Ceramics, Crown and Bridge Construction

If offered in dental schools to students pursuing a first professional degree in Dentistry, most titles here would be classified in the 1804 series.

170104 Oral/Dental Radiology

170199 Dental Services, Other

170201 Cardiovascular/Cardiopulmonary Technologies

170202 NEW CPR and First Aid, CPR and Emergency Care, CPR Certification/Recertification, CPR Update

In the 1990 edition of the *CCM*, these titles were included in 340105, "First Aid/Safety/Lifesaving." The titles above, particularly those carrying two or more credits, are for courses likely to be taken by students in allied health or health science/professions fields. Courses in CPR carrying less than one credit and taken by students in non-health related fields remained in 340105.

170205 DEL Emergency Medical: Ambulance [Titles were merged into 170206]

170206 MOD Emergency Medical: Paramedic/Ambulance; EMT; Emergency Health Care, First Responder, First Aid and Emergency Care

In the 1990 edition of the *CCM*, some of thesetitles were coded under 340105, "First Aid/Safety/Lifesaving." That category has been reconstructed, and titles referring to "Emergency Care" were moved to this position.

CCM Code	
170209	Radiologic (Medical) Technologies, Radiation Dosimetry, Nuclear Medical Technology, Clinical Radiography, Radiation Therapy
170210	Respiratory Therapy Technology, Respiratory Therapy
170211	Surgical Technology
170299 DEL	Diagnostic/Treatment Services: Other [All titles moved to 179999]
170301	Blood Bank/Hematology Technology
170302 DEL	Chemistry Technology [All titles moved to 170309]
170303	Clinical Animal Technology, Animal Care
170309 MOD	Medical Laboratory Technologies, Medical Tech:General, Clinical Lab Technology, EEG, Urinalysis, Analysis of Body Fluids
	All medical technology and specialty laboratory technologies (except hematology technology, microscopy, and medical imaging and sonography)were moved to this category.
170310 DEL	Medical Technology [This category was folded into 170309]
170311	Microbiological Tech/Applied Microscopy
170312 NEW	Medical Imaging, Imaging Technology, Ultrasound,Sonography
170399 DEL	Medical Laboratory Technologies: Other
	All titles involved specialty technologies and were moved to the expanded 170309.
170401	Alcohol/Drug Abuse/Addiction/Treatment, Addiction and Dependency, Dependency Populations/Rehabilitation/Counseling, Substance Abuse Prevention Techniques

But not titles (usually less than three credits) in Alcohol/Drug Abuse Information, for example, "Drug Awareness," "Drug Attitudes," or "Habit Forming Substances." These are student service courses, and were coded under 340106.

CCM Code

170402 Community Health/Hygiene, Community Health and Welfare, Community Health Organization/Services

These titles were distinguished from "Hygiene and Public Health" (182203), "Personal Health and Hygiene" (340101), and "School and CommunityHealth" (131307).

170405 Mental Health, Mental Health Technology/Methods/Treatment/Assisting

170406 DEL Mental Health Technology/Methods/Treatment [Titles folded into 170405]

170407 DEL Rehabilitation Counseling

These titles turned out to be more properly suited to Social Work (440701) or Rehabilitation services (1708 series).

170409 SUS Population/Family Planning [Titles moved to 179999]

170410 Sign Language Interpretation, AMESLAN, Manual Communication, Signing

170499 DEL Mental Health/Human Services: Other

Courses that wound up in this category in 1990, often included the phrase, "Human Services," and were fairly generalized, for example, "Human Services Field-work" or "Human Services Leadership." For the 1995 *CCM* they were moved into a new category for the Helping Professions, 440101, in the Public Affairs section.

170503 Medical/Physician Assisting

170505 Medical Office Management, Medical Office Practice

170506 Medical Records Technology/Administration, Health Record Applications/ Systems

170507 Pharmacy Assisting, Dispensary, Pharmacy Technology

CCM Code	
170599	Allied Health Services: Other
170605	Practical Nursing, Nurse Assisting, LPN
170701	Ophthalmic Services & Technology: All
170801	Art Therapy, Music Therapy, Dance Therapy
170804	Kinesiology, Exercise Physiology, Movement Science
	Not "Creative Movement," which is sometimes a Physical Education Activities course (360108) or an education course (131322).
170806 DEL	Music Therapy [Titles folded into 170801]
170807	Occupational Therapy: all titles
170813	Physical Therapy: All Titles
170816	Recreational Therapy, Therapeutic Recreation
	Note that these are not "recreation" (series 31)titles: they specify "therapy."
170818 DEL	Respiratory Therapy [Titles moved to 170210]
170899	Rehabilitation Services: Other
170901	Health Services and Science: General, Introduction to Allied Health, Contemporary Health Problems, Health Care Systems, Health Delivery Systems, Concepts of Health, Human Disease
	Titles in the 1807 series indicate a more specific focus on health organization management and health care *policy*. The 170901 category, on the other hand, is more generalized. For another distinction, titles referring to "individual health" or "hygiene" were usually classified under 340101. Any title referring to "health" that carried less than three credits was not coded here.

CCM Code

171001 HPER: Intro/General/Survey/History/Concepts

"Health, Physical Education and Recreation" (HPER) covers generic, non-schoolteacher-oriented courses. It was distinguished from "Physical Education" titles that refer to schools (131314), "Recreation" titles (31 series), and physical education activities courses (usually carrying less than 3 credits).

171002 Athletic Injuries/Training, Care and Prevention of Athletic Injuries

171003 Adaptive Physical Education, Physical Education for Special Populations, Recreation for Special Populations

For "adapted" physical education, see 340107.

172001 Medical Terminology

Whether "for secretaries" or "for lawyers" or for somebody else, all medical terminology titles were coded here.

178001 NEW Health Assessment, Wellness, Health and Wellness, Holistic Approaches to Health and Wellness

The faculty review group in allied health suggested this category to collect all such titles, many of which had been previously coded in the 34 series. "Health Maintenance" should be included in this category if the course carried three or more credits.

179001 NEW Clinic: Field Unspecified, Clinical Analysis, Clinical Practicum, Clinical Rotation

These are not Clinical Health Sciences (1802) courses. The titles are often found on the transcripts of students in majoring in health services and technologies, sometimes in hospital schools.

179999 Allied Health: Other

Does not cover such titles as "Math for Allied Health" (270801) or "Medical Law for Health Workers" (229999).

180101 Audiology, Audiometry, Hearing Disorders, Aural Theory, Hearing Science

CCM Code	
180102	Speech Pathology/Neuropathology, Cleft-Palate, Stuttering
180103	Speech-Language Pathology/Audiology, Communication Disorders
180199	Audiology/Speech Path.: Missing, Indeterminable

BASIC CLINICAL HEALTH SCIENCES (1802)

This subsection of the *Classification of Instructional Programs* evidently confused the original (1984) coders of courses in the NLS-72 transcripts. Their confusion was understandable in light of the failure of the CIP to indicate that the topics covered by these codes were normally taught at specialized schools of medicine, dentistry, and health sciences. The original coders thus classified thousands of life science "service" courses for undergraduate students of nursing, allied health, and physical education as various "clinical health sciences."

The 1990 *CCM* reconstruction was designed to correct this misconception, and its decision rules were heavily dependent on institutional type and academic program. For the 1995 edition,the empirical character of the High School & Beyond/So college transcript files forced yet another revision in the treatment of Clinical Health Sciences, for, during the 1980s, the field moved beyond specialized institutions and into the mainstream of U.S. higher education. This group of courses, in fact, has come to rival the biology "service courses" (2608 series) for nursing, and allied health students.

CCM Code	
180201	Clinical Anatomy, Medical Anatomy, Oral Anatomy, Microanatomy, Neuroanatomy
180202	Clinical Biochemistry, Dental Biochemistry, Medical Chemistry, Biochemistry of Medicinals, Clinical Chemistry Courses in "Organic Biochemistry" or "Physiological Chemistry" that normally serve students in nursing and allied health programs, were coded 260804.
180203	Clinical Microbiology, Medical Bacteriology, Medical Mycology
180204	Clinical Pathology "Pathophysiology," on the other hand, was coded with the biology service series (260803).

CCM Code

180205	Clinical Physiology, Medical Physiology

This code was also used to cover courses concerning the study of major functional organ systems, for example, cardiovascular, respiratory, or renal, and courses with the simple title, "Physiology," taught in medical schools and health science centers. "Human Physiology" titles, on the other hand, were classified under biology (260706).

180299	Basic Clinical Health Sciences: Other, Clinical Skills, Clinical Lab, Clinical Methods, Clinical Science (General), Clinical Correlations

See comments under the new 179001 (Clinic) code, and under the revised 170309 (Medical Lab/Tech).

HEALTH PROFESSIONS/SERVICES (1803-1899)

For any national postsecondary transcript sample taken from a cohort at about age 30, the basic viability of many of the health professions codes depends on what percentage of the cohort attended medical, dental, or veterinary school after earning a bachelor's degree. The same condition does not hold for course codes in chiropractic, optometry, and (sometimes) pharmacy, in which the professional degree is usually the first 4-year postsecondary degree earned by the student, hence is the equivalent of a bachelor's degree. Nor does the condition hold for fields such as nursing, public health, and health care administration.

The 1995 *CCM* taxonomy reflects rationalization in the public health and health administration fields that took place during the 1980s, as well as a focused effort to reduce the "unknowns" among courses in the nursing curriculum. To the latter end, three new codes were established in nursing, and the coverage of other nursing categories was expanded.

CCM Code

180301	Chiropractic

Virtually all courses taught in specialized schools of Chiropractic and which contained the key phrase, "for Chiropractic," were placed here.

180401	Dentistry: General
180402	Preventive Dentistry/Dental Public Health
180403	Endodontics, RCT (Root Canal Therapy)

CCM Code	
180404	Oral/Maxial Facial Surgery
180405	Oral Pathology
180406	Orthodontics
180407	Pedodontics
180408	Periodontics
180409	Prosthodontics & Restorative Dentistry, Crowns, Bridges, Bridgework
180410	Operative Dentistry/Oral Surgery
180499	Dentistry: Other
180701	Health Services/Hospital Admin, Hospital/Health Unit Management, Practice Management, Health Care Organization/Evaluation/Marketing, Financing of Health Care
180702	Health Care Planning, Health Care Policy
180703 DEL	Medical Records Administration
	All medical records titles were combined in 170506.
180799	Health Services Administration: Other
180901 DEL	Medical Laboratory
	Titles previously classified here were either Clinical Lab Science (180299) or Medical Imaging (170312). The balance fell in the consolidated category for medical lab technology (170309).
181001	Medicine: General
181003	Anesthesiology
181005	Dermatology
181006	Emergency Medicine

CCM Code	
181007	Family Practice
181009	Immunology, Serology
181010	Internal Medicine
	Includes standard range of internal medicine topics and specialties, such as Cardiology, Thoracic Medicine, Gastrointestinal Medicine, Urology, Endomology, etc.
181013	Obstetrics and Gynecology, OBGYN
181014	Ophthalmology
181016	Orthopaedics
181017 SUS	Otorhinolaryngology/Otolaryngology
181018	Pathology
	Only courses taught in medical schools and health science programs were coded here. See comments under 180204 and 260704.
181019	Pediatrics
181020 SUS	Physical Medicine & Rehabilitation
181022 SUS	Preventive Medicine
181023	Psychiatry
181024	Neurology
181025	Radiology, Nuclear Medicine
181026	Surgery: General/Plastic/Thoracic/Neurological
181029	Hematology
181099	Medicine: Other

CCM Code	
181101	Nursing: General/Principles/Fundamentals/Theory, Nursing Process/Clinic, Professional Orientation, Nursing Tools
181103	Maternal/Pediatric Nursing, Child Health, Obstetric Nursing, Care of Children
181104	Medical/Surgical Nursing, Operating Room Nursing, Emergency Room Nursing, Intensive/Acute Care Nursing, Cardiovascular Nursing
181105	Nursing Administration, Leadership, Professional Roles/Development
181106	Psychiatric/Mental Health Nursing, Nursing People/Families in Crisis
181107	Public/Community Health Nursing
181108 NEW	Nursing Research, Nursing Science
181109 NEW	Geriatric/Gerontological Nursing, Care of Aged/Aging Client
181110 NEW	Life-Cycle Nursing, Child-Adult Nursing/Health,Family Nursing/Health
	Covers all "life-cycle" titles (e.g. Young Adult, Adult, Middle-Age, and combinations) *except* those in 181103 (pediatric, maternal, child) and 181109 (geriatric).
181199	Nursing: Other, Electives, Indeterminable
	Titles that wound up in this category ranged from "Legal Aspects of Nursing" to "State Board Review" to "Transcultural Nursing" to "Episodic Nursing."
181201	Optometry
181301	Osteopathic Medicine
181401	Pharmacy
	Includes all Pharmacy-related titles except Pharmaceutical Chemistry (400505), and Pharmaceutical Law (229999).
181501 SUS	Podiatry [Titles moved to 189999]

CCM Code	
182201	Public Health Lab Science, Epidemiology, Health Research Methods, Infectious Diseases
182202 DEL	Epidemiology
	Titles folded into 182201. If title specified"biostatistics," it was coded 260602.
182204	Public Health Practice/Management
182299 MOD	Environmental Public Health; International Pub Health
182401	Veterinary Medicine, Large Animals, Domestic Animals, Small Animal Clinic, Feline Medicine, Avian Diseases
	The category covers the major titles in the veterinary medicine program. In addition to titles with any abbreviation of "Veterinary" in them (e.g. "Prevent Vet Med"), these include "Clerkship"/"Clinic" coupled with "Large," "Small," or "Domestic" Animals, or (Gross) Anatomy or Physiology of "Domestic Animals," and so forth.
189001	Clinic, Clerkship: Field Unspecified
189999	Health Sciences: Other, Indeterminable

HOME ECONOMICS/VOCATIONAL HOME ECONOMICS (19 and 20)

The problems in these two sections stemmed from the original construction in the CIP system in 1979. That taxonomy was intended to apply to all levels of education, even though the CIP system was subsequently used principally for *postsecondary* analyses. The Vocational Home Economics (VHE) series (20) was developed, in part, to describe high school home economics courses. While some of these titles turn up in postsecondary education, principally in community colleges and proprietary schools, most of them do not. Hence, many of the original codes produced either no data or minimal data, and were dropped for the 1990 *CCM*.

Coders were evidently confused when roughly the same title was used in both the academic Home Economics (HE) series (19) and the Vocational (20), let alone in the personal service areas such as those covered in the 35 (interpersonal relations) and 36 (leisure and recreation) series, social work (4407 series) and design (5004 series). By referring to the identity of the institution and the student's major (where known), many of those cases were resolved in favor of the academic home economics series (19).

CCM Code

190101 Home Economics: General

190201 Business Home Economics & Family Finance

The keyword is "family." "Personal Finance," on the other hand, is coded under Business, 064001.

190301 SUS HE: Family & Community Services, Family & Community

Titles such as "Family Diagnosis and Treatment" usually belong under Social Work (440701), not here. Titles referring simply to "The Family" were coded as 451102. "Community Service," as a title without qualifiers, was coded 440201. For the 1995 accounting, the few titles left after those sortings were classified 199999.

190401 Family/Consumer Management: General

190402 HE: Consumer Science, Consumer Economics, Consumer Issues, Consumer Decisions, Consumer and the Law, Consumer Information, Consumerism

Most "Consumer Behavior" and "Buyer Behavior" courses, however, are part of the marketing curriculum and are coded 061402. Student major or the texture of the transcript are key to the assignment.

190499 DEL Family/Consumer Management: Other

This proved to be an unproductive category in both the 1990 and 1995 accountings. Titles were moved to 199999.

190501 HE: Food Science/Nutrition: General

The word, "nutrition," must be in the title. This is not true of 200108.

190502 HE: Food & Food Sciences, Experimental Foods

Titles referring to "regulatory and food quality standards" would be placed under 020301 if the student majored in agricultural production or agricultural science.

190503 Dietetics/Human Nutritional Services, Diet Therapy, Diet and Disease, Nutrition and Health, Nutrition Care

CCM Code	
190504	HE: Human Nutrition, Principles/Elements, Essentials of. . ., Food & Nutrition, Child Nutrition, Community Nutrition
190599	HE: Food Science/Nutrition: Other
190601	HE: Human Housing: General, Human Shelter, Family Housing, Housing Costs
	Student major is a key to assignment here, as some "housing" titles can be found in Architecture (04 series), Architectural and Civil Technologies (1501 and 1502 series), and Building Trades (46 series).
190602	Household Equipment & Furniture
	General titles on "interiors and furnishings" were classified under 200110. The keywords "decorative" or "decorating" placed the title in 200505.
190603 DEL	HE: Family Housing, the House, Housing Costs [Merged with 190601]
190701	HE: Individual & Family Development: General
	Titles referring to "Adolescent Development" or "Adult Development" usually belong in 420701.
190703	HE: Family Counseling/Stress/Crises
	Student major (where known) should determine the assignment: if Social Work or Human Services, the course was not classified here.
190704	HE: Family Relations
	Also "Marriage and Family Relations," but not "Marriage and Family" (451102).
190705	HE: Gerontological Services
	See comments under 190703. If the student is a nursing major, the course probably belongs under 181109.

CCM Code

190799 DEL HE: Individual & Family Development: Other

190901 Textiles & Clothing: General, Culture/Society and Dress, Dress and Human Behavior

> But the keyword, "consumer," placed a textiletitle in 200103.

190902 Fashion Design/Analysis/Planning/Theories/History

> But titles with reference to "tailoring" were placed under 200305.

190904 Textile Science, Textile Fibers, Textile Testing/Evaluation, Fabric Studies

> Student major is a key to the assignment of"textile technology" titles. An Engineering or Engineering Technology major will place the title in the 14 or 15 series.

190999 Textiles & Clothing: Other

199999 Home Economics: Other

200101 DEL VHE: Consumer/Homemaking Education: General

200102 VHE: Child Development, Care, Guidance, Pre-School Child

> Most of the Child Development (CD) titles are here, but not Child & Adolescent Development (420701), Child Welfare (440701), Child & Family (190701), Exceptional Child (131001), and Early Childhood (most likely an education course, 131204).

200103 VHE: Clothing & Textiles, Clothing Selection, Ready-to-Wear, Textiles for the Consumer

> But all clothing "construction" titles were coded under 200303.

200104 DEL VHE: Consumer Education

> Another case of a secondary school level category. In the High School & Beyond postsecondary transcript sample, titles such as "Consumer Protection" or "Consumer Credit" were coded 190402 and 070201 respectively.

CCM Code

200106 VHE: Family/Individual Health, Consumer Health

The keywords are "family" or "consumer." Without them, the titles should be coded 340101.

200107 VHE: Family Living/Parenthood, Expectant Parents, Parent Education, Parent Co-Op

These are personal service courses designed to assist individuals, as opposed to academic courses in which problems, for example, of "parenting" are studied. For the latter, see 190701.

200108 VHE: Food & Nutrition, Family Food, Family Meal Management, Family Nutrition, Food Selection and Preparation

The keyword in this context is "family."

200109 DEL VHE: Home Management, Housekeeping, Housekeeping Management

The few titles that might have been coded here referred to the management of hotel or restaurant housekeeping, and were placed under 080901.

200110 DEL VHE: Housing/Furnishings/Equipment

Titles included "Refinishing Your Furniture" and "Planning Your Kitchen," that is, "how-to" courses that belonged in the 3601 series.

200201 VHE: Child Care Services, Child Care Management

200203 DEL VHE: Child Care Management [Titles folded into 200201]

200299 DEL VHE: Child Care Services: Other

200301 DEL VHE: Clothing Production & Services: General

All clothing construction/production titleswere consolidated in 200303.

200303 Garment/Apparel Construction, Patternmaking, Sewing, Stitching, Production, Tailoring

CCM Code	
200305 DEL	Custom Tailoring/Fitting/Alteration
	All clothing construction/production titles were consolidated in 200303.
200306	Fashion/Fabric Coordination
200401	Food Production/Management/Services: General
200402	Baking
200403	Chef/Cook
200406	Food Service & Catering
	Included all titles referring to "operations" and "management."
200499	Food Production/Management/Services: Other
200504	Floral Design
200505	Home/Interior Decorating
	Some "interior design" courses were placed here, depending on the texture of the student record. Others were coded 040501.
209999	Vocational Home Economics: Other

INDUSTRIAL ARTS (21)

Industrial Arts (IA) is a section of the *Classification of Instructional Programs* very much like Vocational Home Economics. That is, it was originally designed to describe secondary school courses. In this case, some of the codes and titles proved viable because these courses are offered and frequently taken in Area Vocational/Technical Institutes (AVTIs), which are postsecondary institutions. They are also courses taken by future industrial arts teachers, but, even as such, they were coded here and not under education.

For the 1995 *CCM*, only two IA codes proved viable in terms of meeting the threshold criteria. We moved what would have fallen under "Construction" to a new code for Construction Practice (460901). We also combined all graphics, drafting, and mechanical drawing titles in one category (210106). Institutional type is most likely to determine the placement. For example, "Mechanical Drawing" taken by a mechanical engineering major in a doctoral-degree granting institution was coded 480105, whereas "Mechanical Drawing" taken by a student at a trade school prior to scheduled high school graduation would be coded 210106.

CCM Code

210101 SUS Industrial Arts: General

210102 DEL IA: Construction [All titles moved to the new 460901 code]

210103 DEL IA: Drafting and Design

All drafting, etc. titles were combined in 210106.

210104 IA: Basic Electricity/Electronics

210105 SUS IA: Energy, Power & Transportation

210106 IA: Basic Graphics/Mechanical Drawing/Drafting

These titles are clearly distinguished from Engineering Graphics (145001), or design graphics (5004 series). They are basic.

210107 DEL IA: Manufacturing/Materials

Nearly all titles that might have been coded here in the past turned out to be Industrial Engineering or Materials Science.

LAW (22)

This section was reconstructed along three lines. First, to ensure that the classic curriculum of students seeking LLBs/JDs in law schools was gathered here, as opposed to being scattered elsewhere. Second, to *exclude* courses dealing with the law taught in the context of either business or criminal justice (read "Police Academy") programs. For example, "business law" and "legal environment for business" courses were assigned to 060102. On the other hand, courses in "commercial transactions" taught in law schools were kept here. The same pattern was followed for titles in "criminal procedure." Third, to separate, as much as possible, courses dealing with legal aspects of specific fields and usually taught within those fields. With few exceptions, these were placed in 229999, "Law: Other." Type of institution, student degree level, and student major were all used as criteria in the assignment of specific titles. For example, a course in "constitutional law" taken by a political science major in a comprehensive college was assigned the code, 451003 ("Constitutional Law, Constitutional/ Judicial History") under Political Science.

CCM Code

220101 MOD Law: General, Introductory, Law & Society, Law & Politics, Legal System

220103 DEL Legal Assisting, Para-Legal, etc. [Category renumbered. See 220301 below]

220199 DEL Law: Other [Category renumbered. See 229999 below]

220201 NEW Law [includes Torts, Contracts, Labor Law, Trusts, Administrative Law, Wills, Family Law, Domestic Relations, Agency, Estates, Property, Litigation, Moot Court, Appellate Advocacy, Civil Procedure, Municipal Corporations, Legal Clinic, Patent Law]

This category was reserved for the standard law school curriculum.

220301 NEW Legal Assisting, Research, Writing; Legal Bibliography, Para-legal, Administration of Wills and Trusts, Probate, Preparation of Documents, Legal Terminology, Legal Drafting

220302 NEW Law Office Management

220401 NEW Military Law, Military Justice, Law for Commanders

220501 NEW International Law, Comparative Law, International Arbitration/Litigation, World Law

"International Law Organizations" was coded 440301.

229999 NEW Law: Other

A miscellany of titles wound up in this category, including, "Medical Legal Problems," "Education and the Law," "Pharmaceutical Jurisprudence," etc.

ENGLISH/LITERATURE IN ENGLISH (formerly "Letters"), (23)

The 1990 recoding of English/literature in English courses involved establishing decision rules for different levels of writing courses, for sorting literature courses, for distinguishing literature in translation from literature in the original language, and for delineating borders between English and Communications, Teacher Education, and other fields involving communication/language skills.

In the process, three new 4-digit series were created: 2301 for general literature and genre topics; 2320 for remedial language skills courses; and 2390 for special topics in literature.

The 2301 series categories were used for general titles, along with titles covering groups of authors or genre and period combinations which could not be classified under "comparative," "English," or "American" literature (e.g. "Short Fiction of the 19th Century," "Yeats and Stevens"). If the title specified "English Fiction of the 19th Century," then the course was classified as 230801; "Cummings and Stevens" would be American Literature, 230701. "Walker and Baldwin" would be Afro-American Literature, 230702.

The 2320 series was used to cover basic skills and developmental writing, remedial reading and reading improvement, and basic speech (see commentary on the 09 series with respect to speech). Course titles referring to "Children's Literature" or "Adolescent Literature" are not classified as English courses: they belong in Education under 131323.

For the 1995 *CCM*, there were some minor modifications involving writing courses. New codes were established to account for Writing/English/Proficiency examinations (230403), one of only two places in the taxonomy of *courses* that examinations are so flagged (the other is in engineering), and advanced expository writing (231102).

CCM Code	
230101	Literature: General/Introduction to, World Literature, Literary Masterpieces
230102	Poetry: General/Introduction to, Epic, Lyric, Narrative Poetry
230103	Fiction: General/Introduction to, Short Story, Short Fiction, Novela
230104	Drama: General/Introduction to The category covers drama as literature. It does not include theater arts titles such as "acting," "directing," and so forth. These are covered in 500501. Nor does it cover "history of the theater" and "theater criticism" courses. These are covered in 500502.
230105	Non-Fiction Prose, Biography, Essays
230201	Classical Literature, Greek/Roman Literature (Drama, Poetry) in Translation, [Specific Authors] for example, Aeschylus, Virgil, Plautus; [Specific Works] for example The Odyssey, the Orestia, Classical Mythology The works of classical historians, e.g. Herodotus, Pliny, were not coded here, rather under 450802, "Ancient History."

CCM Code

230202 The Bible as Literature, Poetry of the Old Testament, Life and Language of the Bible, Bible History and Literature

This category is distinguished from Bible studies in a theological context (390201) and various Bible titles under the Religion series (3802). The titles covered here were distinctly secular. Institutional type (Carnegie code) was used as an additional guideline. A Bible course in a Carnegie Code 51 institution (seminary, bible college) was not coded as a "Bible as literature" course.

230301 Comparative Literature: European Literature in Translation, Continental Literature

This is a tricky category. If the student is majoring in a foreign language, the chances are high that a course in that literature (e.g. 19th Century French Fiction) or the work of a single author (e.g. Goethe) will *not* be in translation, hence should be classified under the appropriate code in the 16 series. However, the student's major is not always the best guide. Typical titles under 230301 include Renaissance Literature Continental Fiction, Romanticism, Medieval Epic, Dante/Chaucer/Cervantes (and similar combinations)

230302 Comparative Literature: Non-Western, Third World Literature in Translation

230401 Freshman Composition, Freshman English, College English, Composition & Literature, Composition & Rhetoric, Reading & Composition, Exposition

This is the standard freshman composition course. "Composition and Conversation," however, is probably a foreign language course. The whole student record will set the context for that judgment.

230402 Spoken/Written English; Advanced Grammar, Grammar and Composition, Grammar and Reading, Grammar and Usage

The titles here indicate a level of freshman composition that is somewhat remedial. The emphasis is on "correct usage."

230403 NEW Writing Proficiency, English Proficiency Exams, Writing Competency, Placement Exam, RTP Essay, RTP Reading, English Comp Exam

"RTP" stands for Regents Testing Program, a notable feature of the public higher education system in Georgia. See comments for 907000.

CCM Code	
230501	Creative Writing, Writing Poetry/Fiction/Drama Writing for television, film, and radio is not covered here, rather in 090601.
230601	Linguistics: General, Introduction to, Generative Grammar, Semantics, Philology, Descriptive Linguistics, Contrastive Linguistics, Dialectology, Phonetics This is not Anthropological Linguistics. If the title read "Linguistics/Language and Culture," the course was coded 450206.
230701	American Literature, American Fiction/Drama/Poetry/Humor/Short Story, American Renaissance, American Realism/Romanticism, Transcendentalism, [individual or groups of authors, e.g. "Poe, Hawthorne, Melville"]
230702	Afro-American Literature/Fiction/Drama/Writers, Harlem Renaissance
230801	English Literature: All Periods, Metaphysical Poets, Romantic Poets, Bloomsbury Group, Anglo- Saxon Epic, Victorian Age, Augustan Age, Jacobean Drama, [individual or groups of authors, for example, "Chaucer and His Century"]
230802	Shakespeare
231001	Public Speaking, Debate, Oral Interpretation, Forensics, Parliamentary Procedure, Business & Professional Speaking, Argumentation, Platform Speech, Public Communications "Oral Communications," "Speech Communications," "Introduction to Speech" and other similar generalized titles were coded 090101.
231002	Voice & Articulation, Diction, Speech and Theater Arts, Radio/TV Announcing, Radio/TV Speech
231101 MOD	Technical Writing, Writing in the Disciplines, Writing About . . .(biology, literature, etc.), Business and Professional Writing, Writing in Organizations, Academic Writing, Technical Reporting, Informational Writing, Analytical Writing, Technical Communication

"Business Writing," with no other words, was coded 070703 unless it was a course in an MBA program. With few exceptions, the word, "writing," is the key to all the title assignments here. If the word is "communication," and not "writing," the chances are high that the course should be coded elsewhere, for example, "Professional Communication" was coded 091004. A review of course descriptions from a sample of catalogues indicated that "Technical Communications" should be here, even though such courses often cover the presentation of graphic information along with prose.

CCM Code

231102 NEW Advanced Composition, Argumentative Writing, Advanced Essay

231201 DEL English as a Second Language

The course was renumbered. See 232004 below.

231301 Criticism, Literary History, Theory, Research Methods, Bibliography

232001 Remedial English: General; Basic Skills English, Language Skills, Writing Skills, Grammar, Punctuation, Spelling, Developmental English, Elementary Communication

"Communication Skills" was coded here, not under any 09 (Communication) series category.

232002 MOD Basic Reading, Reading Improvement, Reading Skills, Reading Comprehension

"Speed Reading" was coded here in the 1990 edition. But it is not a remedial course, and was given a separate slot: see 233001 below.

232003 Remedial/Basic Speech, Basic Oral Communication, Basic Oral Skills, Listening Skills

232004 NEW English as a Second Language, ESL

233001 NEW Speed Reading

239001 Other Determinable Literature Topics

Some common examples include Comedy, Satire, Tragedy, Heroism, Science & Literature, Psychology & Literature

CCM Code	
239002	Science Fiction, Fantasy
239003	Folklore, Mythology (General)
239004	Literature & Film/Film as Literature
239999	Letters: Indeterminable

LIBERAL/GENERAL STUDIES (24)

In the original CIP system, these categories were created, in effect, to describe the general Associate's degree. In preparing the 1990 *CCM*, we found many course titles that fit these categories, that is, they did not refer to even the broadest fields of study (for example, science, humanities).

For the 1995 accounting, the High School & Beyond college transcript sample taught us how to use these categories better: to capture honors programs, generic freshman/sophomore/junior seminars, and to account for the rise of courses in "critical thinking" that could not be classified as either "interdisciplinary" or basic skills.

CCM Code	
240101	Liberal Arts & Sciences, Liberal Studies, Lyceum, Freshman/Sophomore/Junior Seminar, Honors Colloquium, General Honors Program, Lecture Series, Contemporary Issues/Ideas
240102	General Studies, Core Curriculum, Great Books
240103 NEW	Critical Thinking, Analytic Thinking, Methods of Inquiry, Practical Thinking

LIBRARY AND ARCHIVAL SCIENCES (25)

Even if the title specified "for the library," such entries as "Storytelling" or "Children's Literature" were classified under 131323 (Reading and Language Arts).

250101	Library/Archival Science: General
250201 SUS	Archival Science, Manuscript Collections [Titles merged with 250501]
250401	Library Science, Cataloging, Classification, Non-Book Materials

CCM Code

250501 MOD Museology, Archival Science, Manuscript Collections

259999 DEL Library/Archival Science: Other

BIOLOGICAL SCIENCES (formerly "Life Sciences") (26)

One of the residual problems in the *CCM* system is that of accounting for courses under the general rubric of "biopsychology." For the 1990 edition, and after consulting with faculty in both disciplines, our basic decision rules for courses normally taught in a biopsychology curriculum included classifying "behavior genetics" under genetics (260615), giving "animal behavior" its own category (260707), making sure that the various neurobiology related titles were classified under "neuroscience" (260608), placing three and four-credit courses in "drugs and behavior" under psychopharmacology (421401), and assigning all other biopsychology titles to physiological psychology (421101). This approach may not please all biology or psychology departments, but from a national perspective, who teaches what is less important than what is taught.

Despite notable contraction in majors (see Section 2), credit-generation (see Section 4), and participation (see Section 5), there were very few changes in the taxonomy for Biological Sciences in 1995.

CCM Code	
260101	General Biology, Introductory Biology, Biosciences Survey, Biology: Zoo + Bot, Organismic Biology, Biology of Organisms, Structure and Function of Organisms Also, titles such as Life Sciences or Concepts of Biology are coded here provided that they have a laboratory specified. See decision rules for 262001.
260102	Human Biology, Human Ecology, the Human Body These courses are sometimes taught in anthropology departments, and often presented in an inter-disciplinary framework.
260201	Biochemistry, Proteins, Enzymes, Enzymology, Nucleic Acids
260202	Biophysics, Biomechanics

CCM Code	
260301	Botany: General, Introduction; Biology of Plants, Seed Plants, Vascular/Non-Vascular Plants But not "Plant Science," which is coded 020401, or "Plant Kingdom," which is coded 260310.
260305 SUS	Plant Pathology: General
260307 MOD	Plant Physiology/Morphology/Development/Chemistry
260308 SUS	Plant Morphology, Plant Growth & Development [Titles moved to 260307]
260310	Plant Taxonomy, Plant Diversity, Plant Systematics, Plant Kingdom
260399	Botany: Other, Indeterminable
260401	Cell Biology
260402	Molecular Biology
260501	Microbiology Most Electron Microscopy titles in 4-year colleges were placed here. The exceptions (along with Microscopy titles in 2-year colleges) were titles such as "Applied Microbiology and Microscopy," assigned to 170311 (Microbiology Technology under Allied Health).
260502	Bacteriology, Virology
260601	Anatomy: Plant and Animal, Microanatomy, Neuroanatomy These are neither A&P (Anatomy and Physiology) courses (see 260801) nor Clinical Anatomy (see 180201).
260602	Biometrics and Biostatistics
260603	Ecology, Population Biology, Bioecosystems, Plant Ecology, Environmental Biology, Aerobiosis, Life Systems

CCM Code	
260604	Embryology, Developmental Biology
260605	Endocrinology
260606	Histology, Cytology
260607	Aquatic Biology, Marine Biology, Limnology, Aquatic Plants
260608	Neurosciences, Neurobiology, Neurophysiology, Brain and Behavior
260610	Parasitology
260612	Toxicology
260613	Evolution, Heredity
260614	Field Biology, Field Natural History, Field Botany, Wildlife Biology, Local Flora/Fauna
	In some ways, all "field" courses are methods courses, and can be grouped together. All the local/state/regional flora and fauna courses are included in this category.
260615	Genetics, Molecular Genetics, Plant Genetics,Human Genetics, Behavior Genetics
260699	Miscellaneous Specialized Areas of Life Sciences: Other
260701	Zoology: General, Introduction
260702	Entomology
260704	Pathology: Human and Animal
	But not if taught in a medical school. See comments for 180204 and 181018.
260705	Pharmacology: Human and Animal
	This category does not include pharmacology courses taught in schools of pharmacy. Those courses are classified as Pharmacy (181401).

CCM Code

260706 Physiology: Human and Animal

260707 Animal Behavior/Language/Communication, Ethology

260708 Ornithology

260799 Zoology: Other

260801 Anatomy and Physiology, Applied Anatomy, Applied Physiology (service course)

> These courses are frequently found on the transcripts of students majoring in nursing, allied health, physical education, recreation, and chiropractic.

260802 Plants and the Environment, Plants & Civilization, Plants and Man

> This is not a "service course" in the same sense as others in the 2608 series, that is, it is not a requirement of other majors. Rather, it is a "babified" version of Botany, and the 1990 faculty rating team did not want to include it in the 2603 series.

260803 Pathophysiology, Introduction to Disease (service course)

260804 Organic Biochemistry, Physiological Chemistry, Human Biochemistry (service course)

> See comments under 260801.

260805 Human Growth and Development

> This course, like 260802, is also less of a "service course" than others in this category. In the NLS/PETS data base, courses with this title were also classified in anthropology, home economics, and psychology. But a catalogue check demonstrated that they were most likely to be a second course in a "Human Biology" sequence, and most likely to be taught in biology departments.

262001 NEW Life Sciences: General/Liberal Arts, Living World, Biology in Contemporary World, Life on Earth, Bio Concepts, Survey of Biological Principles

This category is analogous to those for Chemistry (400520) and Physics (400820) that cover courses presented for students not continuing in science studies at all. For titles such as"Life Science" and "Biological Concepts," the rule for classifying a course here is that the institution also offers a general biology course.

269999 Life Sciences: Other, Indeterminable

MATHEMATICS (27)

Basically, the only mathematics codes in the 1985 version of the CIP that remained untouched by our 1990 reconstruction were those for Statistics (270501) and Mathematics: Other (279999). With the advice of representatives of the Mathematical Sciences Education Board, we threw out the entire CIP classification system (which had only six codes), and set the codes so that all categories coded 2701 were unquestionably pre-collegiate mathematics, and that all categories coded 2702 were college-level but pre-calculus math.

Based on the empirical evidence of the High School & Beyond transcript sample, the 1995 *CCM* refines title sorting under the Calculus and Advanced Math codes, and includes two new codes to capture (a) advanced statistics courses taught in math departments, and (b) "babified" math courses that have less to do with mathematics per se and more to do with the social dimensions of math.

CCM Code	
270101	Pre-Collegiate Math: General, Basic Concepts of Math, Elementary/Intro Math, Essential Math
270102	Arithmetic, Computation, Pre-Algebra Math
270103	Pre-Collegiate Algebra, Elementary Algebra, Intermediate Algebra, Basic Algebra, Preparatory Algebra
270104	Pre-Collegiate Geometry, Plane Geometry
270199	Developmental Math, Other Pre-Collegiate Math, Preparatory Math, Remedial Math
270201	Introduction to College-Level Math, Core Math, Math as Liberal Art, Comprehensive Math, Math for Behavioral/Economic/Social Science, Sophomore Math, Contemporary Math
270202	Finite & Discrete Math, Computer Math, Data Processing Math, Sets and Logic

The computer/data processing math courses classified here are the first level courses in the field. Advanced computer math courses are coded 110801. Discrete math taught in computer science may turn up in a title such as "Discrete Logic," and will be coded 110202.

CCM Code

270203 College Algebra, Trigonometry

270204 MOD Pre-Calculus, Analytic Geometry, Elementary Functions, Analysis, Mathematical Analysis, Intro to Analysis, Calc I (see 270601)

But "Real Analysis" and "Analysis Theory" are advanced math courses and are coded 270701. "Analysis" without any other qualifiers may also be a post-calculus math course. Student attainment in mathematics and major provide the clues. It is also highly unlikely that "Analysis" in a 2-year college is anything but 270204.

270501 Statistics, Probability and Statistics, Descriptive Statistics, Inferential Statistics,

This category is confined to statistics taught in mathematics departments. Other codes in the CIP, both old and new, account for statistics taught elsewhere, for example, 061301 (Business Statistics), 450641 (Economic Statistics), 458001 (Social Statistics), 421501 (Quantitative Psychology), 260602 (Biostatistics), and 147001 (Engineering Statistics).

270502 NEW Advanced Statistics, Stochastic Models, Regression, Probability Theory, ANOVA, Time Series, Path Analysis, Mathematical Statistics, Statistical Models

270601 Calculus, Linear Algebra, Differential Equations, Calc II, Calc III, Calc IV

In institutions with multi-semester/quarter calculus sequences, Calc I will be 270204.

270602 Calculus for Life Sciences/Economics/Business, Short Calculus, Calculus For Tech, Applied Calculus, Calculus for Decision-Making

270701 Advanced Mathematics Topics, for example, Abstract Algebra, Advanced Analysis, Number Theory, Combinatorics, Topology, Game Theory, Modern Algebra/Algebraic Structures, Real Analysis, Complex Variables, Advanced Calculus, Vector Analysis, Partial Differential Equations,History of Mathematics, Fourier Analysis, Math Logic, Matrix Theory, MV/Multilvar Calculus

CCM Code

270801 Technical/Vocational Math, Physical Measurements, Merchandising Math, Nursing Math, Shop Math, Math for Electronics

270901 Business Math: Pre-Collegiate, Business Computations, Business Arithmetic, Consumer Math

> Most courses in this group are really clerical math and bookkeeping math courses, hence arithmetic based.

270902 Business Math: Collegiate, Math for Finance, Math for Business/Economics/ Accounting, Business Algebra

> Some of these courses could involve calculus, but that was not clear from the titles. "Business Calculus" is 270602.

271001 Number Systems, Number/Mathematical Structures, Algebra for Teachers, Geometry for Teachers

> These courses are offered by mathematics departments to Teacher Education majors, yet are not classifiable as "Mathematics Education" (131311). Note that "Number Theory" was coded 270701.

272001 NEW Math Appreciation, Mathematics in Society, Math in the Modern World, the Uses of Math, Cultural Mathematics

279999 Mathematics: Other, Indeterminable

> General "Applied Math" titles wind up here because they don't tell us what kind of applied math is at issue. Nonetheless, if the student is a math or computer science major, "Applied Math" can be classified as 270701.

MILITARY SCIENCES and TECHNOLOGIES (28 and 29)

The courses classified here are usually the generic cadet training courses in the service academies and ROTC programs. Some of the major titles used across all of the services include "Basic Cadet Training," "U.S. Military Forces," "Operations and Tactics," "National Security," Defense Policy/Strategy/Organization, and "The Professional Officer."

For the 1995 *CCM*, "Military Law" and related titles were moved to a special new category under Law, 220401. The Military Technologies series (29), was comparatively unproductive for the 1990 edition, and was completely barren for 1995. The section was thus dropped.

CCM Code

280101 Air Force, Aerospace Studies, Growth/Development of Air Power

> If a course title refers to "Ground School" or "Pilot Training," unless the Air Force is specifically named in the title or the texture of the transcript indicates that the student is either a cadet or ROTC candidate, the title wasclassified under 490102.

280201 SUS Coast Guard Science [Titles moved to 289999]

280301 Military Science, Combined Arms Operations, Small Unit Tactics

> Other titles included "First (Second) Year Basic," which is not a computer programming course, "Command Comm," which is not the name of a software file (the title was also found under 280101), and "Rangers," which is not a game.

280401 Naval Science, Navigation (and Celestial Navigation), Sea Power, Ship Systems, Naval Organization/Management, Central Systems

> "Naval Electronics" was classified here and not under Naval Engineering.

289999 Military Science: Other, Indeterminable

290101 DEL Military Technologies: All

INTER/MULTI-DISCIPLINARY (30)

The *Classification of Instructional Programs* contains a separate section for interdisciplinary programs. Unfortunately, the original (1979) version was somewhat stilted in its conception, and missed a number of key field developments of the 1970s, including environmental sciences-studies and Science, Technology and Society (STS) programs and courses. In addition to reconstructing and filling in this section for the 1990 edition of the *College Course Map*, we created new codes for the Philosophy of Science under Philosophy (the 3801 series) and the History of Science under History (the 4508 series).

For the 1995 *CCM*, the changes in this section occurred as a result of the continued growth and differentiation of women's studies, environmental studies, and STS programs in the 1980s and early 1990s.

CCM Code	
300101	General Science, Natural Science, Science Fundamentals, Basic Science, Integrated Science Some of these may be interdisciplinary, but most are probably broad, multidisciplinary introductions. The category was originally titled, "Biological and Physical Sciences," and, indeed, courses with titles such as that are still offered.
300102	General Laboratory, Lab Techniques, Instrumentation Again, these courses are not so much inter- or multi-disciplinary as unanchored to any particular science, type of science (biological or physical), or engineering.
300103	Introduction to Technology, Technological Studies, Applied Science These are not engineering technology courses that would otherwise be classified as 159001.
300201	Clinical Pastoral Care
300401	Humanities: General, Survey Also covers titles such as Philosophy & Literature. But "Great Books" and "Great Ideas" titles were coded 240102.
300402	Humanities and Social Sciences
300403	Humanities and Arts Combinations such as Literature and Art, or Music/History/Literature are covered here.
300404	Popular Culture Titles here referred explicitly to mass culture and/or media such as comic books, broadsides,television shows, and so forth.
300501	Peace Studies, Conflict Resolution/Management

Ccm Code	
300701	Women's Studies: General and Topics; Feminist Theory, Women in Society, Women's Changing Roles, Women's Lives, Women and Politics, Women and the Law, Women in Business, Feminist Perspectives, Feminist Philosophy Note that there is also a "Women's History" code under History (450870).
300702 NEW	Women in Literature/Art/Music/Film
300703 NEW	Women's Psychology, Psychology and/of Women
300709 NEW	Gender Studies, Language and Gender, Men's Issues, Sex Roles, Masculine/Feminine
301001	Future Studies, Futuristics
302001	Science, Technology and Society (STS), Scientific Values, Genetics and Human Values
302002 NEW	Bioethics, Environmental Ethics, Medical Ethics
303001	Environmental Studies/Issues/Problems, Human Survival, Environment and Society, Natural Environment The titles classified here (those above, and many others) exclude those dealing directly with "conservation" and "regulation" of natural resources, as those titles have their own home in the *CCM* system (0301 and 0302 under "Renewable Natural Resources").
303002 NEW	Environmental Science, Environmental Technology For specific environmental control technologies, see the 1505 series.
304001	Sports and Leisure Studies, History of Sports, Philosophy of Sports, Sports and Society, The Economics of Sports, Sports and the Law
309999	Interdisciplinary Studies: Other This was not a dumping ground for unclassifiable titles (see 908000). The titles here had to be legitimate, for example, "Physics and Modern Art," "Science, Mysticism and Myth," "Materials and Civilization."

RECREATION (31)

These are not physical education or leisure activities courses. Rather, they are occupationally-oriented courses preparing individuals for various roles in the recreation industry.

CCM Code	
310101	Recreation and Parks: General, Community Recreation, Intro to Recreation
310201	Outdoor Recreation, Camp Counseling, Campcraft, Camp Administration
310301	Parks and Recreation Management, Administration of Recreation, Recreation Program Development
310401	Water Recreation/Water Safety, Aquatics Management
310501	Sports Officiating, Refereeing, Umpiring
310601	Recreation Leadership/Supervision
310901	Recreation Practicum/Field Experience
319999	Recreation/Parks: Other

BASIC SKILLS (32)

In the original CIP system, this category mixed both personal service and tutorial/remedial courses in language skills and math. For the 1990 *CCM*, the remedial courses were removed and placed in their respective areas (see the 2320 series for remedial language skills and the 2701 series for pre-collegiate math). The residual categories cover credit-bearing (usually less than three credits) supportive service and counseling activities.

The empirical data driving the 1995 presentation were quite compelling in forcing the addition of two codes in this general area: one dealing with generic workplace habits, the other with library skills. Neither one of these is necessarily "remedial." In fact, when student participation in all remedial courses is presented in Section 5, only 320101 and 320102 are included in the aggregate category.

CCM Code	
320101	Student Development, Individual in Transition, Survival Skills, Support Skills, Out of Class Skills, Developmental Skills, Adult Basic Skills, Adult Basic Education, Development of Competence

CCM Code

320102 Academic/Intellectual/Study Skills, Basic Skills, Learning Strategies, Notetaking, Test-Taking, Memory Techniques, Techniques of Learning

320104 NEW Workplace Skills, Job Skills, Workplace Demeanor, Work Habits

320105 Job Seeking/Changing Skills, Job Preparation, Job Interview Technique, Career Decision, Career Counseling/Planning

320107 Career Exploration/Orientation, Career Information, Careers in "X (Health, Business, etc.)," Occupational Information

320108 Personal Typing, Beginners' Typing, College Typing

> If student major was in Office Occupations, the typing titles were coded under 070702.

320109 NEW Library Skills, Library Orientation, Library Research Methods, Library Competency

STUDENT ACTIVITIES and SERVICE (33)

This section of the *CCM*, originally called "Citizenship/Civic Activities" and designed to record high school curricula, was not used in the coding of the NLS-72 postsecondary transcript sample. The section was revived for High School & Beyond because college transcripts from the period, 1982-1993, were carrying entries for student activities and services that could not be coded anywhere else. While a plurality of these entries do not carry credits, and most do not award letter grades, the fact that they are included on student records should be reflected in this taxonomy.

CCM Code

330101 NEW Student Activities, Student Publications

330201 NEW Student/Community Service, Tutoring

330301 NEW Assemblies, Convocations

> These are secular or generalized. If there is also a reference to "chapel" or "service" in the title, and/or if they were taken in a seminary, they were coded 390701.

HEALTH-RELATED ACTIVITIES (34)

This section covers self-help, health information, and self-improvement courses, not academic courses. Some categories, for example, Aerobics/Jogging or Life-Saving might have been placed in the 36 series, but they are better justified here as basic, personal physical survival and health activities, rather than sports or physical education. "Adapted Physical Education," however, was placed here because it is a special, personal service for handicapped students.

CCM Code

340101 Health & Physical Practices: General, Health and Hygiene, Personal Health, Biofeedback, Health and Safety

The word, "health," in combination with references to school, youth, or children places the course under 131307. Likewise, the title, "Personal and Community Health" was coded as 170402. "Wellness" and "Health Assessment" are both part of a new code under Allied Health (178001) to account for a service function of future health workers.

340102 Sex & Birth-Related Health Practices

340103 Mental Hygiene

340104 Aerobics, Jogging, Body-Building, Conditioning

340105 MOD First Aid, First Aid & Safety/Self-Help, General Safety, Shop Safety, Accident Prevention, Occupational Safety

This category was overhauled for the 1995 *CCM* in light of recommendations from faculty review groups in both allied health/health sciences and engineering/engineering technologies. If the title referred to "emergency care" and carried more than one credit, it was classified under 170206. If the title referred to "CPR" and carried more than one credit, it was assigned to 170202. "Life-Saving" titles were moved to a new category, 340108; and occupational safety titles were moved here as a result of the reconstruction of 150701.

340106 Drug/Alcohol Abuse Prevention, Drug Awareness, Habit Forming Substances, Drug Education

To be distinguished from 170401, a course under which future human service workers are trained as counselors on drug and alcohol abuse matters. This, on the other hand, is a basic student service information course.

CCM Code	
340107	Adapted Physical Education To be distinguished from "Adaptive" PE (171003) under which future recreation workers are trained to design and provide activities for individuals with disabilities.
340108 NEW	Life-Saving, Advanced Life-Saving/Red Cross

INTERPERSONAL SKILLS (35)

These are personal service and development courses, not academic social science courses. The 1990 faculty review team in psychology, in particular, insisted that all "Applied Psychology"-type titles be placed here and not in the 42 series.

CCM Code	
350101	Interpersonal Skills/Relations, Applied Psychology, Personal and Social Adjustment, Human Relations If the course title contains the phrase, "Psychology of . . .," it was coded in 421001, not here. Interpersonal/Small Group Communication courses were placed in 091001, not here.
350102	Relations: Love, Sex, Job; Sexual Awareness/Relationships "Human Relations in Business" was classified as 060601, and "Human Sexual Behavior" as 451003.
350104	Assertiveness, Leadership, Assertiveness Training, Effective Leadership, Personal Effectiveness

LEISURE AND RECREATIONAL ACTIVITIES (36)

To distinguish a physical education activity course (36) from a physical education course to prepare a student for teacher certification (131314) from a physical education/recreation course to prepare a student for non-school-based work in the leisure service industry (1710 series) involved reference to student major, number of credits in the course, and (less often) institutional type.

CCM Code	
360101	Leisure & Recreational Activities: General
360102 SUS	Leisure & Recreational Crafts
360103	Games
360108	Physical Education Activities, Intramural Sports, Individual Sports, Team Sports, (Any sport named individually or in combination, and without the words, "varsity," "intercollegiate," or "team practice")
	We found a problem with dance titles: ballet, square, modern, jazz, and ballroom. As a rule of thumb, square dancing, folk dancing, and ballroom were coded here. Ballet, modern, and jazz dancing were coded under 500301, but the High School & Beyond data are more faithful to that rule than were the data in the NLS-72.
360110	Self-Defense, Karate, Judo, and so forth
360111	Equestrian Activities, Riding, Equitation, Dressage
360112	Yoga, Hatha Yoga, Meditation
360113	Scuba/Skin Diving
360114 SUS	Fishing, Angling, Fly-Casting [Titles moved to 369999]
360115	Riflery, Pistol, etc. (Non-Military)
360199 DEL	Recreational/Leisure Activities: Other
	Renumbered as 369999.
360201	Varsity Athletics: Major Sports, i.e. Football, Basketball; Team Practice/ Football or Basketball; Intercollegiate Sports: Football/Basketball
360202	Varsity Athletics: Other Sports; Team Practice.. Intercollegiate. . .and so forth.
	Golf, Tennis, Baseball, Track, Skiing, Wrestling, Volleyball, and other "minor" sports.
369999 NEW	Recreational/Leisure Activities: Other

PERSONAL AWARENESS (37)

CCM Code

370101	Personal/Self-Awareness, Human Potential, Personal Growth, Self-Appraisal, Self-Development/Image, Personal Development
370102	Coping Skills, Daily Living, Stress, Stress Management
370103	Personal Decision-Making, Personal Goals and Objectives, Life Planning
370104	Personal Appearance, Charm, Poise

In programs involving training for models, flight attendants, cosmetology students, and secretaries, these courses are more than personal service and development — they are required. Sometimes they are not "courses" at all, rather "competencies" entered on transcripts.

370105	Personal Values/Attitudes/Life-Styles

PHILOSOPHY (3801)

Not all course titles with the word "philosophy" belong in the 38 series. "The Philosophy of Sport," for example, was placed under 304001, an interdisciplinary code for "Sports and Leisure Studies." "Political Philosophy/Philosophy of Politics" was classified under political science, along with political theory and ideology titles (451004).

CCM Code

380101	Intro to Philosophy, Basic Philosophical Problems, Philosophical Inquiry, Principles of, Philosophy of Human Nature, Philosophy of Life
380102	Ethics, Moral Philosophy, Applied Ethics, Ethics in Business (or Law, Medicine, etc.), Moral Issues/Problems/Values, Values and Choices

Note that we treated professional ethics courses under philosophy and not under the professional fields. But "Bioethics" and "Environmental Ethics" are accounted for under 302002.

380103	Logic, Formal Reasoning, Deductive Logic, Logic and Methodology

Some analogous titles may be found under math or computer science.

CCM Code	
380104	Aesthetics, Philosophy of Art, Ideas of Beauty
380105	Metaphysics, Epistemology, Philosophy of Knowledge, Being and Knowing, Knowledge & Reality
380106	Philosophy of Language, Ordinary Language Philosophy
380110	History of Philosophy: General
380111	Ancient & Medieval Phil, Pre-Socratic Philosophy, Greek Philosophy
380112	Philosophy: Renaissance through 19th C., Rationalism, Empiricism, Transcendental Philosophy
380113	Contemporary Philosophy: Analytic Philosophy, Existentialism, Phenomenology
380114	Non-Western Philosophy
380120	Philosophy of Education This is not the "Philosophical Foundations of Ed"title that is covered under 130901. The category is best illustrated by a title such as "Plato's Philosophy of Education."
380121	Philosophy of Science, Scientific Inquiry, Scientific Method, Philosophy of Technology
380122	Philosophy of Religion This category was distinguished from Religious Studies (3802, and Theology (390601). If the title referred to the philosophy of a particular religion, it would be coded in religious studies.
380123 NEW	Philosophy of Law
380199	Philosophy: Indeterminable, Other What tends to wind up in this bin are titles such as "Human Freedom," and "Philosophy of Love."

RELIGIOUS STUDIES (3802)

For the 1990 *CCM*, we retitled the field (originally "Religion"), and disaggregated a single code, in order to sort more accurately titles that might otherwise have been classified as "Theology." (39 series) The identity of the institution and (sometimes) the student's major were the principal guides to assigning titles. For example, a "Christian Doctrine" course taught in a state university was coded as Religious Studies; a course with the same title in a bible college was classified under Theology.

CCM Code	
380201	Religion: General, Comparative Topics
380202	Non-Western Religions, Bhuddism, Hinduism, Hindu Texts, Confucius, Taoism, Islam, the Koran
380203	Mormon Texts and History, Book of Mormon, L.D.S. Doctrine
380204	Christianity: All Topics
380205	Judaism: All Topics
380206	Religious Ethics/Morality
389999	Philosophy & Religion: Other

THEOLOGY (39)

Most courses classified as Theology are given in either theological seminaries or denominational colleges. The one exception is "Bible Studies." In order to be classified as 230202 (Bible as Literature/History, etc.) the title had to be explicit. Too many Bible Studies titles were generalized, and the generalized titles were placed here.

CCM Code	
390101	Biblical Languages: Seminary, New Testament Greek, Ancient Hebrew, Aramaic
390201	Bible Studies, Sacred Scriptures, Synoptic Gospels, Pentateuch, Johannine Epistles
390301	Missionary Studies, Evangelism

CCM Code

390401 Religious Education

390501 Religious Music

> Music history courses on such topics as the Mass, Missa Brevis, Requiem, and Sacred Chorales were classified 500906. Music literature courses referring to sacred forms were labelled 500905.

390601 Theological Studies, Apologetics, Eschatology, Homiletics, Liturgy, Sacrament, Talmud, Sermons, Jewish Law

> The category also covers titles referring to the preparation for the ministry and to church organization and administration. *All* religions are included in this category.

390701 Christian Living/Activities, Christian Family, Christian Personal Testimony, Christian Marriage, Chapel, Christian Service

399999 Theology: Other

PHYSICAL SCIENCES (40)

The course categories and coding in the physical sciences were fairly straightforward. For the 1990 version of the *CCM*, the only major debate and reconstruction took place in physics, where there was a conscious attempt to distinguish upper-division treatments of major topics, for example, mechanics or electricity and magnetism, from their treatments in introductory physics courses, as well as to consolidate the various atomic/nuclear physics titles.

For the 1995 *CCM*, physics was again the focus of adjustment, partly as a result of reconfigurations in the Engineering section of the taxonomy and partly to distinguish different kinds of introductory courses in the field.

CCM Code

400101 Physical Sciences: General, Introduction, Concepts in Physical Science

> But not "Physical Environment," which is 303002.

400201 Astronomy, Celestial Mechanics, Cosmology

> "Celestial Navigation," however, is usually Naval Science (280401).

CCM Code	
400301	Astrophysics, Space Science, Solar Physics
400401	Atmospheric Sciences, Meteorology, Climatology, Weather and Climate

CHEMISTRY (4005)

400501	General Chemistry, College Chemistry, Introduction to Chemistry Titles including Intro Chemistry "and" Qualitative or Quantitative Analysis were classified here, not in 400502.
400502	Analytical Chemistry, Instrumental Analysis, Chemical Measurements, Quantitative Analysis, Chemical Calculations
400503	Inorganic Chemistry
400504	Organic Chemistry
400505	Pharmaceutical Chemistry
400506	Physical Chemistry, Structural Chemistry, Structure and Bonding
400509	Other Determinable Topics in Chemistry These included Chemical Literature, Environmental Chemistry, Macroscopic Chemistry, Radio-chemistry, and Agricultural Chemistry. "Food Chemistry," though, was coded 020301.
400510	Research, Independent Study in Chemistry In most other fields of the CIP, the "research" and "independent study" titles are lumped with the "Other" (99) code categories. The faculty rating team here (like that in psychology) urged a separate category.
400520	Applied Chemistry, Liberal Arts Chemistry This category, like 260802 and 262001 in Biological Sciences, was created to split off the unquestionably "babified" versions of the introductory course in the field.

CCM Code

400530 Chemistry for Nurses/Allied Health/Life Sciences (service course)

> "Clinical Chemistry" was coded 180202.

400599 Chemistry: Indeterminable

GEOLOGY AND EARTH SCIENCES (4006 and 4007)

The period covered by the first edition of the *CCM* (1972-1984) saw increased differentiation in geology as a result of the boom in energy exploration and development. This differentiation reversed course in the period on which the second edition is based (1982-1993). Nonetheless, all the specific sub-field codes met the threshold standard for inclusion.

CCM Code

400601 Geology: Introductory, General, Geological Science

> We included titles in stratigraphy and sedimentation here unless they were explicitly linked to paleontology (400604), as well as general titles in geomorphology (unless explicitly linked to mineralogy or petrology).

400602 Geochemistry

400603 Geophysics and Seismology

400604 Paleontology, Historical Geology

400605 Mineralogy and Petrology

> These two topics were sometimes yoked in the course title and sometimes not. It was decided that a single category for both was appropriate.

400699 Geological Sciences: Other

> All the field geology titles were placed here, but there were not enough to justify a separate category.

400701 Metallurgy

400702 Oceanography

CCM Code

400703 Earth Science, Earth History, Earth Materials, Earth Physics, Earth Processes, Earth Science-Evolution

400799 SUS Miscellaneous Physical Sciences: Other

PHYSICS (4008)

400801 Physics: General, Introduction

Course titles for General Physics often consist of sets of topics, for example, "Waves, Optics, Heat, Electricity," or single topics, for example, "Physics II: Electricity and Magnetism." These titles were assigned to 400801. One of the most difficult tasks for a faculty rating team was to sort out intermediate and advanced courses in the same areas from those presented in the introductory course. The decision rules in those cases are discussed below (see 400810, 400811, 400813).

400802 Atomic/Molecular Physics, Nuclear Physics, Particle Physics, Radiation Physics, Reactor Physics

400807 Optics

"Holography" would be placed here unless the student's major was in fine arts or film arts.

400809 Acoustics, Physics of Music

This is often a service course for music and music education majors.

400810 Thermal Science, Thermodynamics, Advanced Thermo, Kinetic Theory

Titles here are clear cases of intermediate/upper division courses in *physics*, not engineering. If "thermodynamics" was listed with other topics, for example, "Mechanics and Thermodynamics," the course was coded 400801 unless the student was an engineering major.

400811 Electricity and Magnetism: Intermediate Course, Electrodynamics, Electrophysics, Laser Physics

To be classified here (as opposed to 400801), the title had to stand alone, and, if a course number was indicated, to be 200 or higher.

CCM Code

400812 Modern Physics

400813 Mechanics, Classical Mechanics, Analytical Mechanics

> The decision rules adopted here are like those for both 400810 and 400811. In addition, institutional type was found to be a reliable guide for courses titled, simply, "Mechanics": if a trade school or AVTI, the course was usually placed in the "Mechanics and Repair" series (47).

400814 Quantum Physics/Theory/Mechanics

400820 NEW Liberal Arts Physics, Physics for Poets, Physics for Non-Science Majors

400830 NEW Physics with Calculus, Math Methods in Physics

> This new category was created principally to capture introductory courses that explicitly emphasized their mathematical base. In combination with 270601 and 270602, it helps us determine the net exposure to calculus in postsecondary education.

400899 Physics: Other

400901 Planetary Science, Solar System

409999 SUS Physical Sciences: Other, Indeterminable

> For the physical sciences during the period, 1981-1993: all courses were accounted for by the sub-field categories, and there was no need for an "other" bin.

SCIENCE TECHNOLOGIES (41)

The principal problem in the Science Technologies ("41" series) categories of the *CCM* was fairly simple. In the NLS-72 data base, covering the 1972-1984 period, there were preciously few instances of titles in these fields, and most of what had been assigned to the 41 Series should have been assigned elsewhere. The result was a very abbreviated section. For the 1995 *CCM*, all science technology courses (biological, nuclear, chemical and metallurgical) were collapsed into a single code. It is important to note that this apparent contraction may not represent trends since 1990 (see Burton and Celebuski, 1995).

CCM Code	
410101 MOD	Science Technologies: All; Biological Technologies, Nuclear Materials Handling Technology, Chemical Technology, Sanitary Chemistry, Metallurgical Technology, Plastics Technology, Process Metals Lab, Biomaterials
410201 SUS	Nuclear Technologies, Nuclear Materials Handling [Titles moved to 410101]
410301 SUS	Chemical Technology, Electrochemical Technology,Sanitary Chemistry [Titles moved to 410101]
410303 SUS	Metallurgical Technology, Process Metals Lab [Titles moved to 410101]

PSYCHOLOGY (42)

The principal task with ostensible titles dealing with human behavior and development was to establish rules that clearly distinguished psychology courses from courses in education, home economics, communications, and, for want of a better term, "personal development and awareness," that is, personal service applied psychology.

A title such as "Interviewing Techniques" well illustrates this problem. One could code courses with that title under communications (09 series), clinical psychology, counseling psychology, or social work (4407). Student major was the principal guide to accurate assignment. Within psychology, the title was assigned to clinical (420201).

Words such as "behavior," "motivation," "emotion," placed a course under Psychology of Personality (421001) unless modified in ways that classified the "behavior" as explicitly abnormal. Users of this taxonomy should also consult the rules for Educational Psychology titles (130801) and the Applied Psychology and Personal Service series (35 and 37).

CCM Code	
420101	Psychology: General, Introduction to, Principles, Behavioral Science
420201	Clinical Psychology, Behavior Control/Modification, Clinical Therapy, Family Therapy, Group Therapy, Behavioral Intervention, Psychotherapy, Hypnosis
420301	Cognitive Psychology, Memory, Perception, Consciousness
420601	Counseling Psychology, Community Psychology
	"Counseling" in combination with "Guidance" was coded 131101.

420701	Developmental Psych, Child Psych, Child Study, Child Behavior, Childhood and Adolescence, Adolescent Psych, Psychology of Aging, Human Development, Principles of Development, Adult Development, Lifespan Psych, Life Cycle
	"Child Development" titles were sometimes classified under 200102, depending on the student's major and the type of institution in which the course was offered. If the word, "Family," appeared in the title, as in "Human and Family Development," the course was classified under home economics, 190701. "Human Growth and Development" titles were usually classified under the biology service courses, 260805 unless the title specified psychology or behavioral science.
420801	Experimental Psychology, Research Methods, Research Design
420901	Industrial Psychology, Organizational Psychology
	"Managerial Psychology" and "Organizational Processes" titles were placed under 061501 in the business administration series.
421001	Personality Psychology
	Includes a host of titles, for example, Motivation, Emotion, Aggression, Dreams, Human Behavior, Psychology of Adjustment, Analysis of Behavior, Personality Development/Dynamics/Theory
421002	Abnormal Psychology, Psychology of Deviance, Disorganized Personality, Behavioral Pathology, Mental Retardation
421003	Human Sexuality, Human Sexual Behavior
	As distinguished from "sexual relations" under 350102.
421101	Physiological Psychology, Biopsychology, Psychobiology, Biological Bases of Behavior, Sensation, Biofeedback, Brain and Behavior
421201	Psycholinguistics, Psychology and Language, Language Development, Language Acquisition
421301	Psychometrics, Psychological Testing
421401	Psychopharmacology, Drugs and Behavior

CCM Code	
421501	Quantitative Psychology, Psychological Statistics If courses in ANOVA, Applied Multiple Regression, etc. are taught in psychology departments, they are classified here and not under the new code for advanced statistics (270502). This is one of the rare cases in which department of instruction is important to the taxonomy, but when the question, "who studies statistics?" is asked, the data here are aggregated with other categories (see Section 5).
421601	Social Psychology, Environmental Psychology, Mass Behavior, Group Interaction, Group Dynamics "Collective Behavior," however, is usually a sociology course, and has its own code, 451106. "Applied Psychology," and Interpersonal/Human/Social Relations courses were coded 350101.
422001	History of Psychology, Philosophy of Psychology
429010	Psychology Field Work, Internships
429020	Psychology Seminars, Readings, Colloquia
429999	Psychology: Missing, Indeterminable

PROTECTIVE SERVICES (43)

The 1970s saw significant amounts of financial support for students to attend college under the Law Enforcement Assistance Act (LEAA). Basically, LEAA provided for the collegiate education of police officers. The number of programs in Criminal Justice mushroomed, and the range of courses offered expanded dramatically. Many of these were "Police Academy" versions of topics also offered — with different orientations — elsewhere in the curriculum. "Community Relations" is a typical case, as it also appears under Human Services (440201). For the 1995 version of the *CCM*, little has changed except that, like other social science fields, criminal justice "went quantitative" during the 1980s (see 430105), and fire protection paid increased attention to hazardous materials.

CCM Code	
430101	Correctional Administration, Corrections Systems, Corrections Theory, Corrections Law

CCM Code	
430102	Corrections: Penology, Probation/Parole, Corrections Practices, Corrections Casework/Counseling, Community-Based Corrections
	Titles here focus on the *operational* aspects of corrections.
430103	Administration of Justice, Courts, Court Administration
	Titles here refer to the operations of the judicial system in general, not the criminal justice system in particular (see 430104). They are not courses in the Judiciary (451003), and are not taught in law schools.
430104	Criminal Justice Studies, Criminal Justice, Law Enforcement and Criminal Justice
430105 MOD	Criminalistics, Evidence, Criminal Investigation, Testimony, Criminal Identification, Search & Seizure, Computer Applications in Criminal Justice, Quantitative Methods in Criminal Justice
430106	Forensic Studies, Forensic Chemistry/Biology, Forensic Medicine/Science, Crime Lab
	Many of these courses are taught by medical school or science faculty, but are offered principally in criminal justice programs.
430107	Law Enforcement: General Police Training, Police Academy, Crime Prevention and Control, Patrol Procedures and Operations, Firearms, Defensive Tactics, Law Enforcement Techniques, Intro to Law Enforcement, Baton Training, Police Report Writing
	These are the basic Police Academy curriculum titles with the exception of those dealing with administration (see 430108).
430108	Law Enforcement Administration, Police Administration, Leadership
430109	Security Services
430110	Internships, Field Experience
430120	Criminal Law & Procedure for Police, Law of Evidence, Legal Aspects of Criminal Justice, Criminal Codes (usually the state is named, for example, "Florida Sentencing Code")

Both student major and institutional type are keys to coding these titles. If taught in a law school at the post-baccalaureate level, a course such as "Criminal Procedure" does not belong here, rather in 220201.

CCM Code	
430130	Police/Community Relations
430140	Traffic Law/Control/Management, Vehicle Codes, Traffic Operations, Traffic Accidents/Investigations
430150	Juvenile Justice/Delinquency/Crime/Procedures, Youthful Offender, Youth Crime
430160	Narcotics, Drug Enforcement
430199	Criminal Justice: Other
430201	Fire Control Technology, Fire Protection Systems, Fire Prevention, Hazardous Materials, Fire Science, Fire Safety Research

For the 1995 *CCM*, a number of titles were moved into this code as a result of the reconfiguration of 150701 (Industrial Safety Technology).

430202	Fire Protection Administration, Fire Department Management
430203	Firefighting, Fire Apparatus/Equipment, Fire Hydraulics, Fire Tactics and Strategy
430299	Fire Protection: Other
439999 SUS	Protective Services: Other, Indeterminable

PUBLIC AFFAIRS (44)

This section of the CIP covers both public administration and social work. In the former, many titles containing the word, "management," might be coded under Business Administration (06). Our guideline was that a reference to the management of nonprofit, public-sector institutions and organizations placed the title in this series.

The social work titles required some minor disaggregation so as to reflect more accurately the type of courses taken by students in the social work and welfare field. For the 1995 *CCM*, a new code covering general introductions to the human service/helping professions fields was moved here (from Allied Health) at the recommendation of the faculty review team.

CCM Code	
440101 NEW	Human Services: General; Intro to the Helping Professions, Human Service Methods/Organizations
440201	Community Services/Organization/Resources
440301	International Organizations, International Service, United Nations
440401	Public Administration/Management, Government Regulations, State Budgetary Process, Public Personnel Administration "Public Finance," however, was coded as an Economics course, 450651.
440501	Public Policy Studies, Public Policy Analysis, Policy Science, Policy Formation/Process, Social Policy
440601	Public Works (Sanitation, Utilities, etc.), Waste Management
440701	Social Work: General Covers titles such as "Child Welfare and Intervention Strategies," for example, but not titles referring to schools.
440702 SUS	Medical Social Work [Titles moved to 440799]
440703	Social Welfare, Social Service Administration
440710	Social Work Practicums, Field Work
440720	Research in Social Work/Welfare
440799	Social Work: Other, Unknown
449999	Public Affairs: Other
450101	Social Sciences: General, Survey, Social Processes, Social Environment, Current Affairs, World Issues, Global Developments A catch-basin category similar to that for Fine and Performing Arts (500101). It is tempting to classify these courses under General Studies/Core Curriculum (240102), but their distinct character would be masked if we did that.

ANTHROPOLOGY (4501)

CCM Code	
450201	Anthropology: General, Introduction, Human Origins, Ascent of Man, Ancient Cultures, Peoples of the World, Culture and Personality
450202	Cultural Anthropology, Ethnology, Folklore, Comparative Cultures, Anthropology of Religion, Magic, Ritual, Cultural Change, Cultures and Traditions, Theological Anthropology, Folk Religion, Witchcraft But not "Cultural Diversity" titles, which are coded 050299.
450203	Physical/Biological/Medical Anthropology, Human Osteology, Biology of Race
450204	Non-Western Peoples & Cultures, Third-World Cultures
450205	Native American (North, South, Meso) Peoples/Cultures
450206	Language, Linguistics & Culture
450210	Anthropology: Readings, Research, Fieldwork
450299	Anthropology: Other, Indeterminable
450301	Archaeology
450401	Criminology, Crime & Delinquency, Criminal Behavior, Crime in America, Terrorism, Victimology, Organized Crime, Violence These are not Administration of Justice (43 series) titles. Student major and pattern of other coursework is usually the key to assignment.
450501	Demography, Population Dynamics/Analysis/Growth

ECONOMICS (4506)

Not all course titles including the word "economics" belong in economics. Titles in Business/Managerial Economics, for the most obvious example, have their own code (060501) under Business; those in Engineering Economics have their own code (141702) related to Industrial Engineering.

In organizing the taxonomy for the 1990 *CCM*, the faculty review group used four broad categories: Core Economics courses (450610-450642), Advanced Economic Analysis courses (45065 series), Historical/Theory courses (45066 series), and other courses.

CCM Code	
450601	Economy & Society, Economic Problems/Issues, Contemporary Economics, the Economic System, World Economics, Economics for Teachers
	Courses with these titles were treated as "pre-disciplinary," that is, as something less than the traditional introduction to the methods, terms, and major concepts of the field. "Consumer Economics" is usually coded 190402, not here.
450610	Economics: Principles, Introduction, Principles & Problems, Basic Economic Theory/Analysis, Fundamentals, Political Economy, Macroeconomics, Microeconomics
	Many introductory-level economics courses are divided into two terms, "Micro" and "Macro." These were not to be confused with intermediate level theory courses in micro and macroeconomics that are usually required of all economics majors. Our decision rule was that unless the words "intermediate or "theory" or "analysis" appeared in a title referring to "Micro" or "Macro," the course was classified here.
450620	Intermediate Microeconomics, Microeconomic Theory, Microeconomic Analysis, Price Theory, Theory of Demand/Cost, Theory of the Firm, Economic Analysis of the Firm, Production Economics/Prices
450630	Intermediate Macroeconomics, Aggregate Economic Analysis, Income and Employment, Growth Theory, Macroeconomic Theory/Analysis, Income Analysis/ Policy, Income and Business Cycles, Business Fluctuations, National Income, National Economy
450641	Economic Statistics, Economic and Business Statistics, Introduction to Quantitative Economics, Mathematical Economics
450642	Econometrics, Forecasting, Forecasting & Business Cycles
450651	Public Finance, Economics of Government, Economics of the Public Sector, Budgetary Process/Controls, State and Local Government Finance
	See comments under 440401.

CCM Code	
450652	International Trade/Finance/Economics, International Monetary Economics, Foreign Exchange, Economics of . . . (Specific Countries)
450653	Monetary Theory, Fiscal Policy, Stabilization Policy
450654	Environmental & Natural Resource Economics, Economics of Environment, Rural/Regional/Urban Economics, Economy of Cities
450655	Labor and Human Resource Economics, Manpower Economics, Manpower Development, Trade Unions and Labor Market, Welfare and Social Security, Wage Theory and Determination, Human Capital
450657	Money & Banking, Money & Capital Markets
450661	History of Economic Thought/Doctrines
450662	Comparative Economic Systems
450663	Economic Development, Third World Economics, Economic Growth in Less Developed Counties, Problems of Underdevelopment
450679	Economics: Other Determinable Topics
	"Consumer Economics" was coded 190402, not here. And both "Managerial Economics" and "Business Economics" were coded 060501.
450699	Economics: Indeterminable

GEOGRAPHY (4507)

Between the generation of the NLS-72 and that of High School & Beyond, the college curriculum in geography began to shift away from a paradigm of "area studies" presentations toward one focused on problems and methods (including quantitative methods). In many respects, these developments parallel those of international studies.

CCM Code	
450701	Geography: General; Introduction; Combined Topics
450702	Remote Sensing, Analytic Cartography, Field Mapping, Spatial Analysis, Image Analysis

CCM Code	
450703	Cultural Geography, Human/Social Geography
450704	Physical Geography
450705	Economic Geography
450706	Urban Geography
450710	Geography of North America/Anglo-America
450720	Geography of Europe, USSR
450730 MOD	Geography of Africa, Near East, Asia, Pacific,Latin America, Caribbean
450740 SUS	Geography of Asia, Pacific [Titles combined with 450730]
450750 SUS	Geography of Latin America, Caribbean [Titles combined with 450730]
450760 NEW	Political Geography, Geography of International Affairs, Geography of World Issues
450770 NEW	Quantitative Geography, Geographical Data Analysis
450799	Geography: Other

HISTORY (4508)

For the construction of the 1990 *CCM*, History presented a major challenge. We decided on four sub-series which were then confirmed by the faculty review group: general titles and topics that cut across nations, continents, and periods; a set of U.S. history titles; a set of European history titles; and a set of non-Western history topics. The U.S. and European history series rely on dates dividing periods, and rules had to be established for sorting courses on one side or another of the dateline. It may sound trite, but the criterion selected was "majority of years." Thus, a course in 18th Century European History crosses the dateline of 1789, but was classified as 450822. A trickier title would be "The Ante-Bellum South, Civil War, and After," but common sense would classify the course under "Topics in U.S. History to 1860" (450811).

In the European series, if a specific country is identified in the title, that fact takes precedence over the period indicated. Hence, "English History, 1485-1714," was classified under "History of Individual Countries" (450826), not "European History: Renaissance to 1789."

For the 1995 version of the *CCM*, two new codes were added in women's history and military history, reflecting the growth of both fields. General titles referring to "World War II" or "World War II Era," however, were usually placed in the "Other" bin (450899) because they could not be called "Military History" and could not be placed anywhere else.

CCM Code	
450801	World History/Western Civilization, Modern World
450802	Ancient History, Classical History, Pre-History, Ancient Greece/Rome/Middle East
450803	Intellectual/Cultural History: General, Non-U.S.
450804 MOD	Economic/Business History All titles, regardless of country or region reference.
450805	History of Religion/Church History
450808	Historiography, Research Methods
450809	History of Science, History of Technology This category also included courses in the history of particular sciences and/or technologies.
450810	U.S. History Surveys The titles here are recognizable either as broad coverages ("The Evolution of the U.S.") or as segments ("U.S. from 1620 to 1860") of a survey.
450811	Topics in U.S. History Through the Civil War, Colonial Society, Revolution and Constitution, National Period, the Age of Jackson
450812	Topics in U.S. History Since the Civil War, the Gilded Age, the Depression, Vietnam War, U.S. in World War II, Civil Rights Era
450815	U.S. Cultural, Intellectual History, American Renaissance
450816	History of Individual States, Regions (e.g. the South, Frontier)

CCM Code	
450817	Afro-American History
450819	U.S. History: Other
	What tends to fall in this category are titles in Diplomatic, Political and Social History that do not refer to a time period. "Crises in U.S. Diplomacy, 1898-1939" would go in 450812, but without the dates, it would be placed here.
450821	European History: Dark & Middle Ages, Early Europe
450822	European History: Renaissance to 1789
450823	European History since 1789, Contemporary Europe, Europe Between the Wars
450826	History of Individual (European) Countries
450829	European History: Other, General; Modern Europe
	European History survey titles analogous to 450810 (for U.S. History) were placed here and not under Western Civ (450801).
450831	Asian History, History of Individual (Asian) Countries/Regions
450832	African History
	Titles such as "North Africa" or "Sub-Saharan Africa" may be classified under area studies (050101) or geography, depending on student major or the texture of the transcript record.
450833	Latin American History, History of the Americas, History of Individual (Latin American) Countries
450839	History of Other World Regions, e.g. Oceana, Modern Middle East, Non-Western Civilization
450870 NEW	Women's History, Women in American History
450880 NEW	Military History, History of the Military Art, U.S. Military History, History of Warfare

But not "World War II" or "War and Society" and similar titles (these usually wind up in 450899).

450899 History: Other, Indeterminable

POLITICAL SCIENCE (4510)

The principal reference point for the 1990 construction of political science categories was the set of test specifications for the Graduate Record field examination. The external faculty reviewers recommended finer distinctions in U.S. government and at least one category to cover political behavior. Courses concerning public opinion and propaganda, without a specific political reference, however, were classified under Communications (090902). Changes for the 1995 *CCM* were minor.

CCM Code

450901 International Relations/Conflict/Communications, International/World Politics, International Political Economy, Border Politics/Relations

> "International Law" taught in law schools was classified under 220501. U.S. Foreign Relations/Diplomacy courses were coded 451012. International Trade courses are 450652 and titles such as"Conflict Resolution" and "War & Peace" were coded 300501.

451001 Political Science/Government: Introduction, Principles of, Essentials, Basic Issues of, Political Problems, Contemporary Issues/Public Affairs

451002 U.S. Government & Politics, Federal and State Government

> Where "Federal and State" were mentioned together, the title was classified here. If "State" stood alone or in another combination, the title went under 451011. Titles covering the Presidency and Congress were also classified here.

451003 U.S. Constitutional Law/Politics/History, Civil Rights, Civil Liberties, Judiciary

> If taught in law schools, these titles were classified under 220201.

451004 Political Theory/Philosophy/Ideology/Thought

> Courses on specific ideologies, e.g. Marxism, Authoritarian Regimes, Theory of Monarchy, etc. were all coded here.

CCM Code	
451005	Comparative Government & Politics, Parliamentary Systems "Parliamentary Procedure," however, was coded under Public Speaking/Debate, 231001.
451006	European Government & Politics The European context and/or countries must be named in the course title to place it here. "Parliamentary Government," for example, would be under comparative government, not European.
451007	Non-Western Government & Politics (including titles specifying Latin America, Near East, etc.), 3rd World Politics, Government in Developing Nations
451008	Methodology, Research Design, Political Statistics
451009	Political Behavior/Elections/Voters, Political Parties, Pressure/Interest Groups
451011	U.S. State, Local Government & Politics, Urban/Rural Politics, County/Municipal Government
451012	U.S. Foreign Policy, Diplomacy, National Security
451020 NEW	Political Sci/Government Internship, Practicum, Washington Intern
451080	Political Science: Other Determinable Topics
451099	Political Science: Indeterminable

SOCIOLOGY (4511)

Note that Demography (450501), Criminology (450401), and Urban Studies (which has a heavy sociological component) all have codes distinct from the 4511 series. For the 1995 *CCM*, there were some minor adjustments in the taxonomy, one resulting from the differentiation of Women's Studies (300701) and one from the growth of the health care/health administration field.

CCM Code	
451101	Sociology: Introduction, General, Principles, Social View of the World, Society and Individual,

CCM Code	
451102 MOD	Marriage & Family, Family System, Sociology of Human Sexuality, Courtship and Marriage, Family in Society, Marriage and Sex "Family Relations" and "Family Development" are usually coded 190704, and "Sociology of Sex Roles" is now coded under the new 300709.
451103	Sociology of Race, Minorities, Ethnic Groups, Race Relations
451104	Organizational Sociology, Organizational Processes, Complex Organizations, Formal Organizations, Organizations and Society, Bureaucracy For an "Organizational Processes" title, student major was a strong guide: an 06 major (Business/Management) placed the title under 061501.
451105	Sociology of Aging, Health, Youth, Death
451106	Social Change, Movements, Collective Behavior, Crowd Behavior, Psychology of Social Movements
451107	Social Theory, Social Thought
451108	Comparative Sociology, Third World Sociology
451109	Social Problems, Deviance, Social Disorganization
451110	Sociological Research Methods, Survey Design, Data Collection
451111	Community/Rural/Urban Sociology
451112	Social Stratification, Inequality, Poverty
451113	Small Group Sociology, Socialization
451114 NEW	Medical Sociology, Sociology of Medicine/Health, Sociology of Health Care
451120	Applied Sociology, Internships
451199	Sociology: Other, Indeterminable

Titles that tend to wind up here include Sociology of Work, Sociology of Religion, Sociology of War, and Political Sociology. "Sociology of Sport" is classified under 304001.

CCM Code

451201 Urban Studies, Urbanization, Urban Economy/Economics

Urban Planning/Development, City Form and Function and similar titles, on the other hand, were classified under Urban Design (040701).

458001 Social Statistics, Statistics for Social Sciences,Quantitative Research in Social Science

Titles here are distinct from those statistics and methodology courses in specific disciplines, for example, Quantitative Psychology (421501), Educational Statistics (13060), and Content Analysis in Politics (451008).

459999 Social Sciences: Other, Indeterminable

CONSTRUCTION TRADES (46)

Most of the courses in this section are taken by students in trade schools, Area Vocational-Technical Institutes (AVTIs), and community colleges. For 1995, a new code was established as a result of the reconfiguration of the taxonomy in construction-related engineering technologies (15 series).

CCM Code

460101 SUS Brickmasonry, Stone, Tile

460201 Carpentry

460301 MOD Electric & Power Transmission Installation, Telecommunications Transmission, Coaxial Cables, Cable Construction/Splicing/Grounding

The new titles in this category, reflecting the growth of the cable industry, refer to installation and mechanics, not design and systems operation (see 100109).

460302 Electrician, Wiring, Electrical Codes

The category includes courses in wiring and electrical codes, but not electrical circuits (usually engineering or engineering technology).

CCM Code	
460401	Building & Property Maintenance
460499 DEL	Miscellaneous Construction Trades [Titles moved to 469999]
460501 DEL	Plumbing, Pipefitting, & Steamfitting [Titles moved to 460503]
460503	Plumbing and Pipefitting: All Titles.
460901 NEW	Construction Practices, Construction OJT, ConstructionEquipment/ Documents/Tools, Blueprint Reading for Building Trades This code was developed particularly for programs in trade schools, Area Vocational Technical Institutes, and some community colleges.
469999 NEW	Building Trades: Other This category covers specialties such as concrete placing/finishing, drywall, floor covering installation, glazing, insulation, painting, plastering, and roofing.

MECHANICS AND REPAIRERS (47)

Most cases of potential miscoding in this area involve failure to take student major, let alone institutional type, into account. A computer engineering major at a research university, for example, who took a course entitled, "Computer Trouble-Shooting," was not taking a course under 470104, "Computer Electronics Repair." On the other hand, a student at an Area Vocational-Technical School who earned a certificate in "Electronics" and took a course entitled, "Computer Trouble-Shooting," was, in fact, taking a 470104 course.

CCM Code	
470101	Electrical/Electronics Equipment Repair: General, Tech Electric, Micro Appliances, Minor Appliances, Electrical Applications
470103	Communication Electronics Repair, Receivers, Telephone
470104	Computer Electronics Repair, Trouble-Shooting
470105	Industrial Electronics

CCM Code	
470201	Heating, AC & Refrigeration Mechanics: General
470202	Cooling & Refrigeration
470203	Heating
470299 DEL	Heating, AC & Refrigeration Mechanics: Other
470301	Industrial Equipment Maintenance & Repair
470401	Electromechanical, Hydraulic, Pneumatic Instrument Repair, Hydraulics & Pneumatics, Pumps But "Hydraulics" titles, in particular are also found in Civil Engineering (140801), Agricultural Engineering (140301), and Agricultural Mechanics (010206). Student major is the principal determinant of coding in those cases.
470499 DEL	Miscellaneous Mechanics & Repairers: Other [Titles moved to 479999]
470501 SUS	Stationary Energy Sources, Conventional Power Generation [Titles moved to 479999]
470601	Vehicle/Mobile Equipment Mechanics: General, Multi-Cylinder Engines, Small Engines
470602	Aircraft Mechanics, Airframe, Powerplant Student major and institutional type are keys to the assignment of titles here, as aeronautical engineers take courses with abbreviated titles such as "Powerplant." Such cases were coded elsewhere, for example, 140201 or 150801.
470603	Auto Body Repair, Chassis
470604	Automotive Mechanics, Electrical System, Tune-Up, Transmission, Engines, Engine Rebuilding, Brakes
470605	Diesel Engine Mechanics, Cummins TM, Detroit TM, 4 Stroke, 2 Stroke

CCM Code

470606 DEL Small Engine Repair

Generic titles were moved to 470601. Motor-cycle engine titles were moved to 470699.

470699 Vehicle and Engine Mechanics: Other

479999 Mechanics & Repairers: Other

Categories here included gunsmithing, locksmith, musical instrument repair, watch repair, and others.

PRECISION PRODUCTION (48)

This is a strange section of the CIP system in that it covers curricula pursued by students in all kinds of institutions and at all postsecondary degree levels. The portions dealing with Drafting (4801) and Graphic/Printing Communications (4802) are cases in point. They reflect much of what traditional college students do in applied arts as well as the growth of the service sectors of the economy. The other subsections of the 48 series, with the exception of welding, are more sparsely populated. In fact, the number of categories either suspended, merged or deleted for the 1995 *CCM* reflects the decline of these skilled crafts in the economy.

The various drafting titles (4801) are not industrial arts courses. They are usually taken as part of Engineering Technology (15 series) programs. The student's total record is the guide to assignment here.

One must also be careful to distinguish the *commercial* art, photography, and lithography titles that belong here from those that belong under either Design (5004) or Fine Arts (5007). This is a case in which knowledge of particular institutions counts in coding. A "Composition and Graphics" course at Rochester Institution of Technology is a 4802 course; at Rhode Island School of Design, it is more likely 500402.

CCM Code

480101 Drafting: General, Technical Drafting

"Engineering Drawing" for fine arts and other non-engineering majors was coded here. For engineering majors, it was coded 145001.

480102 Architectural Drafting/Detailing/Drawing/Rendering/Delineation/Graphics

480103 Civil/Structural Drafting, Construction Drafting/Graphics

CCM Code	
480104	Electrical/Electronics Drafting
480105	Mechanical Drafting, Aircraft Drawing, Industrial Drafting
480199	Drafting: Other
480201	Graphic & Printing Communications: General
480203	Commercial Art, Production Art, Air Brush, Paste-Ups, Media Graphics
480204	Commercial Photography, Advertising Photography, Industrial Photography
480205	Typesetting, Composition, Typography
480206	Lithography, Platemaking
480207	Photographic Lab & Darkroom
480208	Printing Press Operations
480209	Silk Screen Making & Printing
480299	Graphic & Printing Communications: Other
480301 SUS	Leatherworking & Upholstery: All [Titles moved to 489999]
480402	Meatcutting
480501	Precision Metal Work: General
480503	Machine Tool Operation/Machine Shop, Lathe Operation, Vertical Milling, Horizontal Milling, Drill Press, Bench Work
480504	Metal Fabrication, Threads and Fasteners
480506 SUS	Sheet Metal [Titles moved to 489999]
480507	Tool & Die Making

"Tool Design" is an engineering technology course, and coded 150805.

CCM Code

480508 Welding

There are many titles referring to welding. Most of them belong here. Those dealing with the theoretical and design aspects of welding were classified under 150610.

480599 SUS Precision Metal Work: Other

Titles (principally sheet metal and foundry) moved to 489999.

480602 Jewelry Design/Fabrication/Repair

Other than institutional type, there are no clues to distinguish a "jewelry design"title here from one under 500206.

480699 DEL Precision Work: Assorted Materials

480701 Woodworking, Cabinet Making, Millwork, Wood Techniques, Furniture Making

"Wood Production" would be coded in the Forestry series, 030401.

480702 DEL Furniture Making [Titles moved to 480701]

480703 DEL Millwork & Cabinet Making [Titles moved to 480701]

480799 DEL Woodworking: Other [Titles moved to 480701]

489999 RES Precision Production: Other

TRANSPORTATION AND MATERIAL MOVING (49)

As in the case of precision production, there was some rationalization of the taxonomy for the 1995 *CCM*, reflecting contracting in enrollments in sub-fields.

CCM Code

490101 Air Transport: General, Fundamentals of Aviation, Theory of Flight

CCM Code	
490102	Airplane Piloting & Navigation, Ground School, Commercial Pilot, Advanced Aviation, Aircraft Performance, Aviation Meteorology, Instrument Flight, Sailplane Indoctrination, Flight Instruction, Glider Instruction
	"Aeronautics" is usually classified as 150801, not here.
490104	Aviation Management, Aviation Laws/Regs/Safety, Airport Operation, Air Traffic Control, Aviation Problems, Normal/Emergency Operations
490105 DEL	Air Traffic Control [Titles moved to 490104]
490106 SUS	Flight Attendants [Titles moved to 499999]
490107	Airplane Piloting: Private
490199 DEL	Air Transport: Other
490201	Vehicle & Equipment Operation: All
	This category covers titles referring to truck and bus driving, construction equipment operation, and mining equipment operation, all of which originally had their own CIP codes.
490301 NEW	Water Transport; Sailors, Deckhands, Rigging, Signaling, Deep Water Diving
490304 SUS	Deep Water Diving [Titles moved to 490301]
490308 SUS	Sailors & Deckhands [Titles moved to 490301]
490399 SUS	Water Transport: Other [Titles moved to 490301]
499999	Transportation: Other

FINE AND PERFORMING ARTS (50)

Most of the recoding work for the 1990 *CCM* focused on either disaggregation of general categories such as art history and music history, or on distinguishing *performance* from production courses in dance and theater. And while many "Film Studies" courses are taught in literature departments, unless "literature" was specifically referenced in the title, the course was classified in the 5006 series (otherwise the course would be 239004). The 1995 version of this series simply refined and elaborated the topical coverage under the various codes.

CCM Code	
500101	Visual & Performing Arts: General, Survey, Art Forms, Experiencing Arts, Concepts in Art, Issues in Art, Art/Music, Drama/Film
500102	Visual Communications, Visual Experience,Visual Analysis/Thinking/Research, Visual Form
	The consensus elements of college catalogue descriptions indicate a general visual semiotics course. The illustrative contexts included advertising, television, and graphics.
500201	Crafts: General
500202	Ceramics, Pottery
500204	Fiber/Textiles/Weaving, Loom
	"Textiles and Clothing" (190901) would not be coded here, although student major and overall transcript "tone" must be used with "Clothing and Textiles" (sometimes 200103).
500205 SUS	Glass, Glassblowing [Titles moved to 509999]
500206	Metal, Jewelry
500299 SUS	Crafts: Other [Titles moved to 500799]
500301	Dance, Choreography, Labanotation
	Folk, square, ballroom, and social dancingtitles were not classified here, rather in 360108. See comments for 360108.
500302	History of Dance
500401	Design: General, 2D, 3D, Design and Composition
500402	Graphic Design/Arts/Lettering, Calligraphy, Marker Indication, Keylining
	If the student was an engineering major, the words "design" or "graphics" would point to coding the course 140101 or 145001.

CCM Code	
500403	Illustration Design, Illustration, Technical/Product Illustration
500404	Industrial Design, Product Design, Packaging
500405	Theater Design, Stagecraft Includes Costuming, Make-up, Lighting, Set Design, and other related titles. "Costuming" is not a home economics course.
500499	Design: Other
500501	Dramatic Arts, Acting, Directing
500502	History of Theater, Drama Criticism
500601 MOD	Film Arts: General, Language of Film, Film and Society "Scripting" and "Screenwriting" courses are now in the new category covering writing for the media (090601).
500602	Cinematography/Film-Making/Production, Film Animation, Film Techniques, Sight and Sound, Film Editing, Cartoon Workshop, Narrative Workshop, AFI Seminar Courses in "Lighting," "Projection," and 8 mm and 16mm techniques were coded under Communication Technologies (100102).
500605	Photography, Light/Colors, Black & White Photography, Portrait Photography, Still Photography, History of Photography
500606	Video
500607	History of Film, Theory, Criticism, Film Genres, Hollywood History, Film Aesthetics, International Cinema, Contemporary Cinema, Film Styles, Film Noir All course titles referring to films of noted directors (Huston, Bergman, Eisenstein) are coded here, along with courses in film genres (mystery, romance, documentary).
500699	Film Arts: Other, Indeterminable

CCM Code	
500701	Fine Arts: General, Theory, Principles, Foundations/Fundamentals of Art, Basic Studio, Studio Arts, Studio Fundamentals
500703	Art History & Appreciation
	Includes courses in all periods, movements, artists (for example, Dutch Mannerists, Cubism, Monet).
500704	Arts Management
500705	Drawing, Drawing and Painting, Drawing and . . .
	The word, "drawing," in combination with other fine arts media, placed the title here.
500706 SUS	Intermedia [Titles moved to 500799]
500708	Painting, Watercolor, Oil
500709	Sculpture
500710	Printmaking, Intaglio
500711	Color, Color Theory, Color and Design
500730	Non-Western Art: Hist & Appreciation, Oriental Art, Art of Sub-Saharan Africa
500740	History of Architecture, Appreciation of Architecture, Architectural Criticism
500799	Fine Arts: Other
500901	Music: Ear Training, Dictation, Solfeggio, Sight-Singing, Basic Musicianship, Music Fundamentals, Introduction to Music
500902	Music History & Appreciation: General, Art of Listening, Concert Music/Hour, Heritage of Music, Humanities: Music, Masterpieces
500903	Music Performance, Applied Music, Music Lessons, Band, Chorus, Orchestra, Ensemble, Chamber Players, Conducting, Class Piano, Class Woodwind, Class Strings/Percussion/Brass

CCM Code	
500904	Music Theory, Form and Analysis, Harmony, Counterpoint, Orchestration, Arranging, Composing
500905	Music Literature, Brass/Woodwind/Keyboard/Strings Literature
500906	Music History: Classical, Baroque, Romantic,Chamber, Symphony
500907	Music History: Opera & Musical Theater, Musical Comedy, Broadway
500908	Music History: Jazz
500909	Music History: Pop, Rock, Folk
500910	Music History: Afro-American Music
	A title such as "Duke, Miles, 'Trane" is Jazz History (500908), even though all three subjects are African-Americans. "History of Motown" would be here.
500920	Non-Western Music
500960 NEW	Business/Industry of Music, Music Copyright, Music Careers
500999	Music: Other, Indeterminable
509999	Visual & Performing Arts: Other

OTHER (90)

Three new codes were added to this residual section for the 1995 *CCM*. Two of the three were designed to help users account for procedures (credit-by-examination) or place of study (study abroad) that were increasingly indicated on college transcripts during the period covered by the High School & Beyond/Sophomore cohort's college experience (1982-1993).

901000	Cooperative Education, Internship: Field Unspecified
902000	Readings, Independent Study: Field Unspecified

"Tutorial" was coded here if it was a discrete form of non-remedial, academic independent study or seminar. It is distinct from both "tutoring" as a student service (330201) and remedial work.

CCM Code

903000 College/Freshman Orientation

904000 Senior Seminars, Theses: Field Unspecified, Capstone Course: Field Unspecified

905000 NEW Study Abroad: Field Unspecified

The titles in this category did not indicate specific subject matter. "Florence Semester" or "Mexico Field Experience" were typical entries. Titles indicating specific subject matter were coded with the rest of the taxonomy. These were comparatively easy to identify as study abroad, since they are usually entered on transcripts in clusters, with a special term designation.

907000 NEW Credit by Examination, CLEP, AP, DANTES, CLAST, TASP, Advanced Placement: Fields Unspecified

Again, these titles did not indicate specific subject matter. Where specific subject matter was indicated, the title was coded with the discipline, and the "termtype" variable on the High School & Beyond postsecondary transcript file was set to indicate credit by examination. CLAST (College Level Academic Skills Test) was unique to public institutions of higher education in Florida, and TASP (Texas Academic Skills Program) to those in Texas. The English exams under the Georgia Regents Testing Program (RTP) are found in 230403.

908000 Unclassifiable Titles

909000 NEW Transfer Course(s): Field Unspecified

Transfer courses with specified field and title were coded with the rest of the taxonomy in both 1990 and 1995.

999998 NEW [Journal Entries]

Journal entries are not courses. They are used on transcripts to indicate student status (e.g. "Non-Resident Semester"), key events (e.g. "Certificate Awarded"), adjustments (e.g. "'Incomplete' Removed"), or the title of the student's program (e.g. "Aircraft Mechanic").

999999 Missing

Section 4:

The Empirical Core Curriculum

Modern arguments about "core curricula" in undergraduate education are a century old, deriving from the introduction of the elective system at Harvard by Charles Elliot, and continuing through its counterpoint, Robert Maynard Hutchins' consolidation of common curricula in the first two years of higher education at the University of Chicago (Levine, 1981; Rudolph, 1977). After a period of considerable growth and diffusion of curricula in four-year colleges and fractures in the mission of two-year colleges during the period, 1965-1980, these arguments were born again, and in less elite contexts. While U.S. higher education is always undergoing reform and experiments of one kind or another (Riesman and Grant, 1978), the reform period of the 1980s was characterized by complaints that the curriculum had lost focus, that it was incoherent (Bennett, 1994; the Association of American Colleges, 1985; Boyer, 1985; Cheney, 1989) and that its bewildering presentation ultimately damaged student development (Study Group on the Conditions of Excellence in American Higher Education, 1984).

These arguments were normative. They were couched in terms of what students "should" study, requirements for degrees, options for meeting those requirements. Their examples often came from college catalogues and faculty surveys, and sometimes, if they ventured into empirical waters, enrollment data provided by learned societies. With few exceptions, the combatants of the 1980s pretended that there was no core curriculum, no concentration of matter in the diffusion of knowledge in either four-year or two-year institutions. We must forgive their ignorance: they didn't have national transcript samples.

The "study group" that wrote *Involvement in Learning* for the U.S. Department of Education in 1984 recognized that the existing data available for analysis of curriculum and performance were limited, and called for the use of national transcript samples as the most objective, accurate, and potentially rich source of tracking curricular concentration, fragmentation, and change. Transcripts reflect what students actually do, not what a catalogue says they might do. Transcripts also reveal a student's intensity of involvement with an academic subject through a very simple, time-honored accounting system for representing time-on-task: credits.

Whatever one may think of credits as a currency, they can be used to demonstrate roughly how much time a generation of college students spent studying specific subjects. If we add up all the credits earned by a cohort of students over 11 or 12 years, we have a finite box. We can then ask what percent of that time was accounted for by statistics or finance or art history or electrical engineering, for example. To be sure, this accounting does not include credits attempted but not earned due to withdrawal or failure. Nor does it account for non-credit time or audits. But the accounting can trace and help us measure concentration and diffusion in what students study; it can show us the empirical core curriculum.

The NLS-72 and High School & Beyond/So transcript sample data can be structured to answer this question about any group of students or any type of institution. The "empirical core curriculum" at highly-selective colleges, for example, looks very different from that at moderately selective colleges; and that at moderately selective colleges looks very different from the "core curriculum" at non-selective institutions (Adelman, 1994). Other approaches using transcript samples can tell us what courses students in a given institution are most likely to "share" (Ratcliff, 1992), and this is another reasonable approach to delineating the empirical core. But measures of time may be a more profitable approach to the national ledger.

For the tables in this section, we have a fairly straightforward illustration of what this accounting can do. Table 4.1 takes bachelor's degree recipients from both cohorts, and compares the lists of those courses that accounted for the highest proportions of their academic time. The "top 30 courses" by this credit-ratio measure, the reader will note, account for a little more than a third of all undergraduate credits earned in both cohorts. The order in the list of the "top 30 courses" in terms of credit generation is that for the High School & Beyond/So transcript file.

Table 4.2 takes bachelor's degree recipients from the High School & Beyond/So cohort only, and asks the question by race, i.e. "Is there a difference in the empirical core curriculum experienced by students of different racial/ethnic backgrounds?" Using the top 25 courses in terms of credit ratios, the answer: not much. Seventeen of the 25 courses are common to bachelor's degree recipients from all racial/ethnic backgrounds. The exceptions make eminent sense in light of other information on student majors.

As a guide to interpreting these tables, recall that there are over 1,000 course categories, hence, for any one category to account for even 0.5 percent of the total earned credits of a cohort over 11 or 12 years is to account for a great deal of time.

Pointers for Reading Table 4.1:

The changes in the empirical core curriculum have been substantial, and reinforce the bottom lines of the account offered in Section 5. Specifically:

- Business extended its rule. Five of the top 30 credit-bearing courses in HS&B were in business and accounting and captured 5.6 percent of all credits earned, versus four courses and 3.4 percent for the NLS-72 sample.

- Despite the fact that they normally carry more credits than other courses (because of laboratory sections), core introductory science courses lost "credit share" in the 1980s.

- On the other hand, college-level mathematics courses increased both their presence and share of credits. This development is partly an outgrowth of the rise of business courses, since accreditation standards for business administration and accounting programs ratcheted up their math prerequisites in the 1980s.

- Twenty-five of the 30 courses are common to both lists. Five courses fell out of the "top 30" empirical core curriculum between the two cohorts, but they did not fall far:

American Literature (from #22 to #36)
Developmental Psychology (from #23 to #31)
Geology: Intoductory/General (from #26 to #52)
English Literature (from #28 to #34)
German: Intro/Intermediate (from #30 to #47)

Of these changes in position (out of 1,038 categories), the most instructive may be the slippage in the standing of geology, a field that saw heightened attention in the 1972-84 period as the result of energy crises and increases in energy exploration-related jobs. The empirical curriculum *is* heavily influenced by perceptions of the labor market. When the labor market effects of the energy crises passed, so did interest in geology.

- The reader will notice a slight increase in the concentration of the empirical core curriculum for bachelor's degree recipients: from 34.6 percent to 35.4 percent of all credits earned. If we changed the reference point to the "top 30" courses for *all* students who earned more than 10 credits, the increase in concentration would be greater: from 34.3 percent to 38.0 percent of all credits earned. What does this mean? A small group of courses is accounting for a greater portion of student time. Students are thus increasingly engaged in what economists would call "rationalizing activity."

Pointers for Reading Table 4.2

- The reader should not make too much of the differences among sub-groups in credit ratios for a given course category unless they exceed 0.5 percent. There are such differences in the case of Calculus and Spanish, for example, but no differences whatsoever for General Psychology and General Biology. In fact, using the 0.5 percent criterion, there are no differences in credit ratios for 9 of the 17 courses that all four race/ethnicity groups hold in common, and no differences for 4 others which are held in common by three race/ethnicity groups.

- The two lists that are most akin in terms of both course categories and credit ratios are those for white students and Latino students. No doubt this similarity reflects the roughly comparable proportions of these two groups of students who major in engineering, computer science, life sciences, and the arts (see Table 2.5).

- White, black, and Latino college graduates hold 23 of the 25 empirical core curriculum courses in common. Asian-American students hold 20 of the 25 courses in common with their peers, and of the five unique to their experience, four are driven by the fact that they are overrepresented among engineering and science majors.

The Curriculum of Actual and Potential School Teachers

The popular literature presents a portrait of the pre-service curriculum of school teachers as long on education courses and short on content courses. The principle of credit-share applied in the presentation of the empirical core curriculum can be invoked to test this proposition.

The population in table 4.3 consists not merely of those High School & Beyond/So students who majored in education (usually elementary education, early childhood education, and special education), but also (a) those who majored in other subjects, took 12 or more credits in education *including* student teaching/practicum (i.e., an activity that is part of the certification process for secondary school teachers), (b) those who both earned 12 or more credits in education *and* indicated, at age 20, that school teaching was a potential or likely occupation for them at age 30, and, if not in any of these groups, (c) those who were working as school teachers in 1991. These groups, together, constitute a universe of "potential school teachers." Some 64 percent of them were employed as school teachers in 1991, and another 7 percent in other education or human service capacities. For an alternative definition based principally on the criteria of student teaching or a post-baccalaureate statement of consideration of becoming a school teacher, see Henke, Geis, and Giambattista, 1996.

What table 4.3 does is first, set forth the credit shares of those education courses accounting for 0.4 percent or more of the total credits earned by this group of potential school teachers, and then, takes four (4) major content areas and compares the credit shares of content courses to those of education subject-methods courses for this group. The reader sees both the credit-share for individual courses and the overall ratio of time-on-content to time-on-methods. Table 4.3 is an illustrative, not exhaustive, account of the undergraduate course-taking of potential school teachers. But the education credits here amount to 25.0 percent of their total undergraduate time, and the content credits, exclusive of psychology (5.4 percent of credits), amount to an additional 30.9 percent.

In other words, table 4.3 covers *over half* the undergraduate time of potential school teachers in the HS&B/So cohort. Its major exclusions are such commonly-required courses as freshman composition and physical education activities, foreign language study (principally Spanish, with some French), and common lower division selections such as introductory communications, art history, music appreciation, and accounting. Together, these account for an additional 10.6 percent of credits earned.

What table 4.3 does *not* indicate is the depth of study in content areas. For that task, one would have to ask after the number of credits earned in each of the broad fields covered here, and analyze the results for people who became school teachers versus those who remained "potential teachers" at age 30. We would find, for example, that 24 percent of school teachers earned more than 12 credits in science while 30 percent of the residual group of "potential teachers" reached that benchmark. This is a very different kind of accounting than that of credit-ratios.

Table 4.1--Changes in the Empirical Core Curriculum of Bachelor's Degree Recipients, 1972-1993; Top 30 Courses by Percentage of Total Credits Earned

NLS-72: 1972-1984		HS&B/So: 1982-1993	
Course	% of Credits Earned	Course	% of Credits Earned
1) English Composition	2.9	Same	3.1
2) General Biology	1.9	Intro Economics	2.3
3) General Psych	1.9	Calculus	2.0
4) General Chemistry	1.9	Same	1.8
5) Calculus	1.6	General Psych	1.7
6) Intro Economics	1.5	Intro Accounting	1.6
7) U.S. History Surveys	1.5	General Biology	1.3
8) Physical Ed Activities	1.5	Advanced Accounting	1.3
9) General Physics	1.4	Same	1.3
10) Music Performance	1.3	U.S. History Surveys	1.2
11) Intro Sociology	1.3	Spanish: Intro & Intermediate	1.2
12) Spanish: Intro & Intermed.	1.1	Pre-Calculus	1.1
13) World/Western Civilizaton	1.1	Intro Sociology	1.1
14) Advanced Accounting	1.1	Physical Ed Activities	1.0
15) U.S. Government	1.0	World/Western Civilizaton	1.0
16) Literature: Intro, General	1.0	Business Law	0.9
17) Intro Accounting	1.0	Management: General	0.9
18) French: Intro & Intermed.	0.9	Computer Programming	0.9
19) Intro to Communications	0.9	U.S. Government	0.9
20) Organic Chemistry	0.8	Marketing Management	0.9
21) Art History	0.8	College Algebra	0.9
22) American Literature	0.8	Corporate Finance	0.9
23) Developmental Psychology	0.7	Statistics	0.9
24) Student Teaching/Practicum	0.7	Intro to Communications	0.9
25) Statistics	0.7	French: Intro & Intermediate	0.8
26) General Geology	0.7	Music Performance	0.8
27) Business Law	0.7	Art History	0.8
28) English Literature	0.7	Literature: General, Intro.	0.7
29) Management	0.6	Student Teaching/Practicum	0.6
30) German: Intro & Intermed.	0.6	Organic Chemistry	0.6
Total percent of credits earned:	34.6%		35.4%

SOURCE: National Center for Education Statistics: National Longitudinal Study of the High School Class of 1972 and High School & Beyond/Sophomore Cohort.

Table 4.2.-The Empirical Core Curriculum of Bachelor's Degree Recipients in the HS&B/So: Top 25 Courses Measured by Credit Ratio, by Race/Ethnicity.

	Percentage of Total Credits Earned			
Course	White	Black	Latino	Asian
English Composition	3.0	3.3	3.0	2.8
Intro Economics	2.4	2.1	2.3	2.3
Calculus	2.0	1.4	1.9	3.4
General Chemistry	1.8	1.4	1.8	3.0
General Psychology	1.7	1.7	1.6	1.7
Intro Accounting	1.7	1.4	1.7	1.3
Advanced Accounting	1.3	1.2	1.6	0.8
General Biology	1.3	1.4	1.3	1.3
General Physics	1.2	1.2	1.3	2.5
U.S. History Surveys	1.2	1.0	1.3	0.7
Intro to Sociology	1.1	1.3	1.1	0.9
Spanish: Intro & Intermed	1.1	2.0	2.6	0.8
Pre-Calculus	1.1	1.3	1.0	2.0
World/Western Civ.	1.0	1.3	1.0	1.1
Business Law	0.9	0.9	0.9	—
Management: General	0.9	0.9	1.0	—
Marketing Management	0.9	—	0.8	—
Physical Ed Activities	0.9	0.9	1.0	0.8
U.S. Government	0.9	0.9	1.2	0.7
Statistics (Math)	0.9	0.8	—	0.9
Finance	0.9	—	0.9	—
Computer Programming	0.9	1.0	1.0	1.1
College Algebra	0.8	0.9	1.0	—
Intro to Communications	0.8	1.0	0.9	—
French: Intro & Intermed	0.7	0.8	—	0.8
Others in Top 25				
Afro-American Studies		0.9		
Literature: Intro, General		0.8		
Electrical Engineering			0.9	1.7
Spanish: Advanced, Lit			0.8	
Mechanical Engineering				1.2
Post-Calculus Math				1.0
Statics, Dynamics				0.8
Art History				0.7

Source: National Center for Education Statistics: High School & Beyond/Sophomore Cohort, NCES CD#98-135.

Table 4.3–Illustrative Course-Taking of Education Majors, Potential Teachers, and School Teachers in the High School & Beyond/Sophomore Cohort, 1981-1993

Universe: All students who either (a) earned bachelor's degrees in education or (b) earned bachelor's degrees in other fields and accumulated >12 credits in education and indicated, at age 20, that school teaching was a potential or likely occupation for them at age 30, or (c) were employed as school teachers in 1991. Weighted N=97,422. Proportion with undergraduate degrees in education: 55 percent.

Percent of All Undergraduate Credits Earned

Education Courses		Related Courses in the Disciplines	
Student Teaching/Practicum	4.8%		
Intro to Education	1.2		
Materials & Methods	0.8		
Curriculum/Curric Theory	0.6		
Educ Testing/Measurement	0.6		
Social/Philosophical Foundations	0.4		
Educ/Instructional Media	0.4		
Early Childhood Education	0.8		
Elementary Education	0.6		
Secondary Education	0.4		
TE: Physical Education	1.2		
TE: All Other	2.5		
Special Ed: General	1.2		
Special Ed: All Other	1.0		
Other Education Credits	0.7		
Ed Psych	1.4	General Psychology	1.8
		Developmental Psych	1.3
		Abnormal Psychology	0.3
		Social Psychology	0.3
		Personality Psychology	0.3
		Psychology: All Other	1.4

[Ratio of Psychology Credits to Ed Psych Credits= 3.86 to 1]

Education Courses		Related Courses in the Disciplines	
Reading Education	1.6	Intro to Literature	0.9
Language Arts Education	1.6	American Literature	0.8
English Education	0.1	English Literature	0.7
		Public Speaking	0.6
		Creative Writing & Journalism	0.5
		Advanced Essay Writing	0.2
		Technical Writing	0.2
		Shakespeare	0.2
		Linguistics	0.2
		Literature: All Other	1.4

[Ratio of Lit & Writing Credits to Reading/Lang Arts Ed Creds=1.73 to 1]

Table 4.3–Illustrative Course-Taking of Education Majors and Potential Teachers (cont'd)

Mathematics Education	1.4		
Algebra/Geometry for Teachers	0.4		
		Calculus	0.9
		College Algebra	0.8
		Pre-Calculus	0.6
		Pre-College Algebra	0.5
		Statistics	0.5
		Intro to College Math	0.4
		Post-Calculus Math	0.2
		Finite & Discrete Mathematics	0.2

[Ratio of Mathematics Credits to Mathematics Ed Credits=2.28 to 1]

Science Education	0.7		
		General Biology	1.8
		General Chemistry	1.1
		Anatomy & Physiology	0.5
		General Phys Science	0.4
		Astronomy	0.4
		General Geology	0.4
		Zoology	0.3
		Earth Science	0.3
		Intro to Physics	0.3
		Ecology	0.3
		Other Science	2.5

[Ratio of Science Credits to Science Education Credits= 11.86 to 1]

Social Studies Education	0.6	U.S. History Surveys	1.9
		World/Western Civ.	1.2
		Intro to Sociology	1.2
		U.S. Gov't & Politics	0.9
		Intro to Economics	0.9
		Marriage & Family	0.3
		Intro to Geography	0.3
		Intro to Anthropology	0.3
		Physical Geography	0.3
		Cultural Anthropology	0.3
		Other Social Sciences	5.2

[Ratio of Social Sci Credits to Social Studies Ed Credits= 21.3 to 1]

Source: National Center for Education Statistics: High School & Beyond/Sophomore Cohort, NCES CD#98-135.

Section 5:

Changes in the Proportion of Students Earning Undergraduate Credits in Specific Courses

In the tables in this section, the unit of analysis is the student, not the instance of course-taking or credit-production (Section 4).

In these tables, we include only cases in which students actually earned credits by passing the course in some way. The reason for doing so is to indicate that we know these students probably learned something about subject X, whatever it was. A student who withdrew or failed a course may also have learned something, but there is no evidence in the records. A student who audited a course also may have learned something, but small number of audits (less than 0.1 percent in both NLS-72 and HSB/So samples) will fall through the cracks of programming these data.

Pointers for Reading the Tables:

1) Courses with asterisks were those whose parameters were modified substantially between the 1990 and 1995 taxonomies. The reader should consult Section 3 for the details.

2) The participation rate for bachelor's degree recipients will always be higher than that for all students who earned more than 10 credits, with the exception of courses normally taken in short-term vocational programs, e.g. building trades, or associate's degree occupational programs, e.g. medical technologies.

3) Graduate and professional school courses are not included here, therefore the participation rates in such areas as the medical professions are so low that we have dropped those categories from the table.

Pointers for Interpretation:

1) In this presentation, one sees the evidence and effects of internal reconstruction in academic fields.

2) Notice the increases in student participation in a variety of writing and communications courses, not only in remedial English.

3) The same patterns (as in #2) can been seen in mathematics statistics, and quantitative courses taught outside math departments.

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses

NLS-72 = High School Class of 1972 to 1984 (age 30);
HS&B/So = High School Class of 1982 to 1993 (age 29)

Universe: Only courses in which credits were earned are included. If a student withdrew from or failed a course, the event is not included here. These are weighted data.

		All Students Earning >10 Credits		**All Bachelor's Degree Students**	
Code	**Field**/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
	Agriculture/Agr Science				
10101	Agric Bus & Mgt: Gen	0.6	0.8	0.7	1.1
10102	Agric Business	0.5	0.7	0.5	1.0
10103	Agric Economics	1.3	0.9	1.8	1.3
10104	Farm & Ranch Mgmt	0.7	0.5	0.8	0.7
10199	Ag Bus,Mgt & Mkt:Oth	0.2	0.2	0.2	0.4
10201	Agric Mechanics/Elect	0.3	0.4	0.3	0.3
10204	Agric Power Machinery	0.3	0.4	0.4	0.3
10205	Ag Struct, Equip, Facil	0.3	0.2	0.4	0.1
10206	Ag Soil/Water Practices	0.5	0.3	0.9	0.4
10301	Agric Production/Suppls	0.2	0.2	0.2	0.2
10302	Animal Production	0.7	0.6	0.9	0.6
10304	Crop Production	1.0	0.7	1.2	1.0
10507	Horse Handling & Care	0.3	0.2	0.3	0.2
10601	Horticulture	0.9	0.3	1.2	0.4
10603	Ornamental Horticult	0.6	0.2	0.7	0.3
10605	Landscaping	0.5	0.3	0.6	0.4
19999	Agribus/Ag Product:Other	0.4	0.4	0.6	0.5
20101	Agric. Sciences: General	0.7	0.4	1.1	0.3
20201	Animal Sciences: General	1.3	1.3	1.9	1.5
20202	Anim Breed,Reprod,Genetics	0.6	0.4	0.9	0.5
20203	Animal Health	0.3	0.4	0.4	0.4
20204	Animal Nutrition,Feeds	1.0	0.6	1.3	0.9
20206	Dairy	0.4	0.2	0.5	0.3
20208	Livestock	0.8	0.4	1.0	0.4
20299	Animal Sciences: Other	0.2	0.3	0.3	0.4
20301	Food Sciences/Systems	0.6	1.1	0.9	1.6
20401	Plant Sciences: Gen	0.8	0.5	1.1	0.5
20402	Agronomy, Crop Science	0.5	0.4	0.7	0.5
20403	Horticultural Science	0.3	0.2	0.4	0.2

Table 5.1.-Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning > 10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
20408	Plant Protect/Pest Mgt	0.3	0.4	0.3	0.5
20409	Range Management	0.3	0.1	0.4	0.1
20501	Soil Sciences/Systems	1.9	1.0	2.8	1.3
29999	Agric Sciences: Other	0.3	0.2	0.4	0.2
	Renewable Nat. Resources				
30101	Renew Nat Resources,Energy	0.4	1.0	0.6	1.7
30201	Land/Water Use/Mgt/Conserv	0.2	0.5	0.4	1.0
30202	Conservation: General	1.9	0.9	3.0	1.4
30203	Resource Regulation/Policy	0.2	0.4	0.4	0.7
30301	Fishing & Fisheries	0.2	0.1	0.4	0.1
30401	Forestry Production: Gen	0.2	0.1	0.3	0.1
30501	Forestry & Rel. Sci: Gen	0.7	0.3	0.9	0.4
30502	Forestry Sci.,Dendrology	0.5	0.2	0.7	0.3
30506	Forest Mngmt/Silviculture	0.4	0.1	0.5	0.2
30509	Wood Sci, Forest Mensurat	0.3	0.2	0.4	0.4
30601	Wildlife Mgmt & Conserv	0.7	0.5	1.2	0.9
39999	Renewable Nat Resour: Oth	0.4	0.1	0.6	0.1
	Architecture/Envir. Design				
40101	Archit & Envir Design: Gen	0.2	0.5	0.4	0.7
40201	Architecture	1.0	0.9	1.4	1.4
40301	Commun & Region. Planning	0.6	0.2	1.2	0.5
40401	Environ Design/Systems	0.7	0.4	1.0	0.7
40501	Arch. Interior Design	0.7	0.4	0.9	0.6
40601	Landscape Architecture	0.5	0.3	0.6	0.5
40701	Urban Design/Devel/Form	0.2	0.4	0.5	1.0
49999	Arch & Envir Design, Other	0.2	0.2	0.4	0.4
	Area Studies				
50101	African Studies	0.7	0.5	1.1	0.9
50102	American Studies, Amer Civ	4.7	5.3	6.6	7.9
50103	Asian Studies: General	0.6	0.9	1.0	1.6
50104	East Asian Studies	0.7	0.9	1.2	1.6

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning > 10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
50105	East European Studies	0.1	0.1	0.1	0.2
50106	European Studies: Gen.	0.7	0.9	1.3	1.8
50107	Latin American Studies	1.0	1.1	1.7	1.9
50108	Middle Eastern Studies	0.5	0.6	0.8	1.1
50109	Pacific Area Studies	0.2	0.1	0.3	0.3
50110	Russian and Slav Studies	0.5	0.8	0.9	1.5
50111	Scandinavian Studies	0.2	0.1	0.3	0.2
50112	South Asian Studies	0.1	0.2	0.2	0.4
50114	Western European Studies	0.2	0.5	0.3	0.9
50115	Canadian Studies	0.2	0.1	0.3	0.3
50199	Area Studies: Other	0.1	0.6	0.2	1.1
	Ethnic Studies				
50201	Afro-Amer/Black Studies	2.2	1.5	3.1	1.9
50202	Native American Studies	1.7	1.0	2.9	1.7
50203	Hispanic American Studies	1.0	0.5	1.3	0.9
50205	Jewish Studies	0.5	0.4	0.9	0.9
50206	Asian-American Studies	0.1	0.1	0.1	0.2
50299	Cultural/Multicult Studies	0.3	0.3	0.4	0.6
	Business Administration				
60101	Gen. Business Principles	10.7	17.6	9.1	18.7
60102	Business Law, Legal Envir	15.8	21.7	20.2	30.9
60103	Business & Society	N.A.	1.0	N.A.	2.0
60104	Business and Government	1.5	1.0	2.6	2.1
60201	Intro. Accounting	20.7	30.2	23.0	39.4
60202	Tax Accounting	4.4	5.2	6.9	9.1
60203	Account.: Cost, Audit etc.	9.3	11.2	14.7	20.1
60301	Finance: Princ., Corporate	9.1	13.5	16.4	27.2
60302	Bank/Finan. Inst. Operats	1.1	1.5	1.5	2.5
60303	Securities and Investments	2.3	3.0	4.1	5.8
60401	Management: Gen, Theory	13.7	20.1	19.2	31.0
60403	Operations & Product Mgmt	4.3	7.3	7.6	15.1
60501	Business Economics	0.9	1.8	1.5	3.6
60601	Personnel Mgt/HRD	6.3	8.5	8.5	13.8

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

Code	Field/Course	All Students Earning > 10 Credits		All Bachelor's Degree Students	
		NLS-72	HS&B/So	NLS-72	HS&B/So
60701	Institutional Management	0.4	0.6	0.6	0.6
60705	Transportation Management	0.6	0.5	1.0	0.8
60801	Insurance/Risk Management	2.3	2.4	4.0	4.5
60901	International Management	0.7	1.6	1.3	3.5
61101	Labor/Industrial Relations	3.2	2.9	5.2	5.4
61201	Mngment/Bus Informat Syst	1.6	3.9	2.7	7.3
61301	Business Statistics	4.3	6.9	7.2	12.7
61302	Operat Research/Decis Sci	3.3	2.2*	6.4	4.5*
61303	Managmnt Sci/Bus Research	1.0	4.3*	2.0	8.6*
61401	Marketing Management	7.6	16.3	12.6	29.1
61402	Marketing Research	2.1	4.2	4.0	8.3
61501	Organizational Behavior	6.4	8.4	10.8	16.8
61701	Real Estate	3.1	3.1	4.4	4.9
61801	Small Business Management	1.5	3.0	1.6	4.2
63001	Internships in Business	0.7	2.1	0.9	2.9
64001	Personal Finance	2.0	3.1	2.9	4.9
66001	Entrepren, New Venture Mgt	N.A.	0.4	N.A.	0.8
69999	BusAdmin: Indetermin/Oth	3.1	2.3	4.4	3.8
	Business Support				
70101	Account/Bookeep Support	0.8	1.7	0.1	0.5
70102	Computer Accounting	0.3	1.3	0.1	0.4
70103	Bookeeping	0.6	0.6	0.1	0.2
70104	Office Machines	2.8	3.4	1.2	1.5
70199	Account/Bookeep Supp: Other	0.2	<0.1	0.1	<0.1
70201	Banking/Related Support	0.3	0.6	0.2	0.2
70301	Business Data Process: Gen	2.4	2.5	2.8	3.2
70302	Business Comput Operation	0.5	1.0	0.5	0.4
70303	Bus Data Entry Operation	0.7	0.5	0.2	0.2
70305	Business Data Programming	0.5	0.4	0.7	0.4
70401	Office Supervis./Mgmt	2.1	2.4	1.5	1.7
70601	Secretarial Progs.: Gen	6.2	1.3	2.5	0.3
70602	Court Reporting	0.2	0.1	<0.1	---
70603	Executive Secretarial	0.3	0.3	0.1	0.2
70604	Legal Secretarial	0.4	0.5	0.2	<0.1

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
70605	Medical Secretarial	1.0	0.8	0.1	---
70607	Stenography	5.6	3.8	1.9	1.3
70699	Secretar. Progs.: Other	0.5	0.3	0.1	0.1
70701	Office Org/Automation/etc	3.3	1.8*	1.6	0.6*
70702	Typing, Clerk-Typist	5.9	8.7	1.9	3.8
70703	Bus Correspondence/Memos	1.0	8.6*	0.5	10.8*
70705	Records Managemnt, Filing	1.7	1.9	0.4	0.5
70707	Receptionist	0.2	0.1	<0.1	<0.1
70799	Gen. Office Progs: Other	0.8	0.4	0.4	0.2
70801	Word Processing	0.2	4.7	0.1	2.3
70802	Other Office Software	N.A.	2.1	N.A.	1.2
70803	Computer Keyboarding	N.A.	0.7	N.A.	0.3
70901	Bus. English, Punctuation	6.4#	3.1#*	5.5#	1.2#*
79999	Bus. Support: Other	0.2	0.5	0.1	0.2
	Marketing and Retailing				
80102	Fashion/Apparel Marketing	0.5	1.0	0.4	0.8
80103	Fashion Modeling	0.2	0.2	0.1	0.1
80201	Beauty Salon Mgmnt/Sales	N.A.	0.3	N.A.	---
80202	Display, Exhibit Design	0.3	0.9	0.2	0.8
80601	Food Marketing, Grocery	0.2	0.1	0.1	---
80702	Indust Sales/Customer Rels	0.3	0.2	0.5	0.3
80703	International Marketing	0.5	0.8	1.0	1.5
80704	Purchasing, Buying	0.5	1.2	0.4	1.3
80705	Retailing	2.6	2.9	3.2	3.6
80706	Sales & Salesmanship	3.2	4.5	3.6	6.3
80708	Marketing/Distrib: Gen	7.0	5.1	10.2	7.2
80799	Gen Marketing/Distr: Other	0.7	0.4	1.0	0.6
80901	Hospitality/Recreat Mrktng	0.2	0.4	0.3	0.5
80906	Sports/Entertain Marketing	N.A.	0.1	N.A.	0.3
81001	Insurance Operations	0.4	0.3	0.7	0.5
81101	Transport/Travel Marketing	0.3	0.3	0.4	0.2
81104	Tourism	0.1	0.4	0.1	0.6
81105	Travel Services, Ticketing	0.1	0.3	0.1	<0.1
81203	Auto Vehicle/Servs Operats	0.1	0.2	0.1	0.1
89999	Market/Distribution: Oth	0.4	0.3	0.7	0.2

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning > 10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
	Communications				
90101	Communications:Gen.,Oral	29.3	27.6	35.8	33.5
90201	Advertising, Copywriting	5.0	5.8	7.1	8.6
90301	Communicat/Rhetor Theory	1.1	1.0	1.9	1.9
90302	Communications Research	N.A.	0.8	N.A.	1.6
90401	Journalism: Reporting,Edit	3.6	3.6	5.8	6.3
90402	Magazine Writing, Lay-Out	N.A.	0.4	N.A.	0.8
90403	Broadcast News/Newswriting	N.A.	0.7	N.A.	1.4
90404	Photojournalism	N.A.	0.3	N.A.	0.6
90501	Public Relations	2.0	2.5	3.1	4.6
90601	Writing for the Media	1.2	1.3*	2.1	2.3*
90701	Radio/TV: Gen.,Directing	2.3	2.7*	3.7	4.8*
90702	Broadcast Industry/Manag	N.A.	0.3	N.A.	0.5
90801	Telecommun Policy/Manag	N.A.	0.3	N.A.	0.5
90901	Mass Communications	4.0	6.1	6.6	10.1
90902	Public Opinion/Propaganda	0.6	0.9	1.3	1.8
90903	Communic Ethics,Regulat	0.8	2.0	1.6	3.7
91001	Interpers/Small Grp Commun	6.1	9.2	8.6	14.1
91002	Interviewing	0.3	1.0	0.4	1.7
91003	Intercultural Communic.	N.A.	0.5	N.A.	0.9
91004	Profess/Manager Communic	N.A.	2.1	N.A.	3.2
92001	Internships in Communicat	0.5	1.4	0.9	2.5
99999	Communications: Other	2.0	1.3	2.9	2.3
	Communications Technologies				
100101	Educational Media Technol	0.8	0.7	1.5	1.2
100102	Motion Picture Technology	0.1	0.4	0.1	0.8
100103	Photographic Technology	0.2	0.4	0.2	0.4
100104	Radio/TV Production Techn	0.7	1.0	1.0	1.7
100105	Sound Recording Technol	0.2	0.8	0.3	1.3
100109	Telecommunic Technology	N.A.	0.4	N.A.	0.7
100199	Communic Technols: Other	0.2	0.8	0.3	1.1

Table 5.1.-Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

Code	Field/Course	All Students Earning >10 Credits		All Bachelor's Degree Students	
		NLS-72	HS&B/So	NLS-72	HS&B/So
	Computer Science				
110101	Intro. Computer Sci.	5.6	15.3	8.4	22.2
110102	Computer Literacy	1.6	5.7	2.2	6.9
110201	Computer Programming	7.5	16.9	10.2	25.0
110202	Algorithms, Computer Logic	0.5	1.6	0.8	2.6
110203	Machine Lang/Comput Org	0.8	3.3*	0.9	5.3*
110204	Compiler Lang/Lang Theory	0.5	1.2	0.7	2.2
110301	Data Processing: Gen, RPG	5.9	9.9	4.7	9.6
110302	Data/Discrete Structures	0.4	2.4	0.6	4.9
110305	Comput Networks, LAN	N.A.	0.9	N.A.	1.6
110401	Info Sci/Systems/Networks	0.9	3.9*	1.3	6.2*
110402	Data Base Syst/Managemnt	N.A.	1.6	N.A.	2.7
110501	Systems Analysis, Design	1.3	4.7	1.8	7.1
110502	Software Engin/Develop	N.A.	1.1	N.A.	2.2
110601	Comput Applications: Gen	0.4	2.1	0.5	2.6
110602	Comput Applics: Sci&Engin	0.5	2.8	0.7	4.6
110603	Comput Applicat: Business	0.8	4.0	1.4	6.5
110604	Comput Applicat: Other	0.3	1.8	0.5	2.6
110701	Simulation, Modelling	0.4	0.6*	0.6	1.2*
110702	Theory Algorithm/Automata	N.A.	0.4	N.A.	0.9
110703	AI, Expert Systems, etc	N.A.	0.5	N.A.	1.1
110704	Computer Graphics Design	N.A.	0.5	N.A.	1.0
110801	Numeric Analysis/Methods	0.8	1.6	1.5	3.1
110901	Oth Comput Sci Topics	0.4	1.0	0.6	1.5
119999	Comp.Sci: Indeterm	0.3	1.1	0.5	1.9
	Personal Services				
120403	Cosmetology, Barbering	0.5	1.9	0.2	0.1
129999	Consumer/Pers Servs:Oth	0.2	0.3	0.2	<0.1
	Education				
130101	Education: General	4.9	4.4	7.9	8.3
130201	Bilingual/Crosscult Educat	0.3	0.8	0.5	1.6
130301	Curric. & Curric. Theory	1.4	1.3	2.6	2.7

Table 5.1.-Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

Code	Field/Course	All Students Earning >10 Credits		All Bachelor's Degree Students	
		NLS-72	HS&B/So	NLS-72	HS&B/So
130302	Instruction:Methods/Mater	4.4	2.6	8.5	5.0
130401	School Admin, Ed & Law	0.6	0.4	1.1	0.7
130404	Educational Supervision	0.2	0.1	0.4	0.1
130501	Educational Media	2.6	1.4	5.0	2.9
130502	Computers in Classroom	N.A.	0.5	N.A.	1.1
130601	Evaluat and Research: Gen	0.6	0.4	1.2	0.9
130603	Educational Statistics	0.2	0.2	0.4	0.3
130604	Educat Testing, Measure	3.1	1.7	6.1	3.6
130699	Educat. Research: Other	0.3	<0.1	0.6	0.1
130801	Educational Psychology	12.1	5.8	21.5	11.3
130901	Soc,Hist,Phil Foundations	6.4	1.6	11.7	3.0
131001	Special Educat.: General	3.0	3.3	5.5	5.7
131003	Spec.Ed:Deaf/Hear Impaired	0.2	0.1	0.4	0.3
131004	Spec.Ed:Gifted & Talented	1.0	0.2	1.7	0.3
131005	Spec.Ed:Emotionally Hand.	0.3	0.2	0.5	0.4
131006	Spec.Ed:Mentally Handic.	1.1	0.2	2.1	0.4
131007	Spec.Ed:Multiple Handic.	0.2	0.1	0.3	0.3
131011	Spec.Ed:Learning Disabils.	0.9	0.4	1.8	0.9
131012	Spec.Ed:Speech Correction	0.8	0.2	1.5	0.5
131099	Spec.Ed.: Other	1.3	0.4	2.5	0.8
131101	Stud. Counseling,Guidance	0.8	0.2	1.4	0.4
131102	Higher Ed Stud. Pers Servs	0.1	0.5	0.1	1.4
131201	TE:Adult and Continuing Ed	0.1	<0.1	0.2	0.1
131202	TE:Elementary Education	4.5	1.0	8.5	2.0
131203	TE:Junior High/Middle Sch.	0.1	0.1	0.3	0.2
131204	TE:Early ChildhD/Pre-Elem	2.6	1.6	4.4	2.6
131205	TE:Secondary Education	3.7	1.1	7.5	2.0
131206	Higher Education Teaching	N.A.	0.2	N.A.	0.4
131302	TE:Art Education	4.4	2.0	7.9	3.9
131304	TE:Driver and Safety Educ	0.6	0.3	1.1	0.4
131305	TE:English Education	1.6	0.6	3.1	1.1
131306	TE:Foreign Language Educ	0.4	0.2	0.7	0.5
131307	TE:Health/Nutrit. Educ	3.9	2.7	7.0	4.5
131311	TE:Mathematics Education	4.4	2.6	7.9	4.8
131312	TE:Music Education	4.2	2.0	8.0	3.9
131314	TE:School Phys. Ed.	5.6	3.0	9.3	5.3
131315	TE:Reading Education	4.7	3.0	9.2	6.6

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

Code	Field/Course	All Students Earning >10 Credits		All Bachelor's Degree Students	
		NLS-72	HS&B/So	NLS-72	HS&B/So
131316	TE:Science Education	3.0	1.8	5.8	3.9
131318	TE:Social Studies Educ.	3.0	1.6	6.0	3.5
131320	TE:Vocational/Tech Educ.	0.5	0.2	0.9	0.3
131322	TE: Drama and Dance Educ.	0.7	0.6	1.2	1.2
131323	TE: Lang. Arts, Childs Lit	5.5	3.6	9.7	6.4
131399	TE: Other, Indeterminable	0.4	0.5	0.8	0.9
131401	TESOL	0.1	0.1	0.2	0.2
131501	Student Teaching,Practicum	6.5	4.0	12.5	8.1
139999	Educ.: Indeterm., Other	3.9	1.0	6.9	2.1
	Engineering				
140101	Engineering: General	2.0	3.2*	3.0	5.5*
140201	Aerosp/Aeronaut Engin.	0.4	0.5	0.7	0.9
140301	Agricultural Engineer	0.4	0.3	0.8	0.4
140401	Architectural Engineer	0.5	0.4	0.9	0.8
140501	Bio/Biomedical Engineer	0.2	0.3	0.4	0.5
140701	Chemical Engineering	0.5	0.8	1.0	1.5
140801	Civil/Transport Engin	1.1	1.1	1.9	2.3
140901	Computer Engineering	1.3	2.6	2.3	5.4
141001	Elect/Communc. Engin	2.8	3.9	4.6	7.6
141101	Engin Mechanics/Statics	3.0	4.7	5.1	8.5
141201	Engineering Physics	1.4	0.9	1.6	1.5
141401	Envir/Envir Health Engin	0.3	0.5	0.6	1.0
141501	Geol/Geophysical Engin	0.1	0.2	0.2	0.5
141701	Industrial Engineering	0.8	1.0	1.2	2.0
141702	Engin Economics/Mangmnt	1.0	1.7	2.2	3.5
141801	Materials Engineering	1.6	2.6	2.8	5.2
141901	Mech Engin/Engin Thermo	1.8	3.3	3.3	6.7
142001	Metallurgical Engin	0.2	0.3	0.3	0.5
142101	Mining/Mineral Engin	0.1	0.1	0.1	0.1
142201	Naval Arch/Marine Engin	0.2	0.1	0.4	0.2
142301	Nuclear Engineering	0.2	0.2	0.4	0.5
142501	Petroleum Engineering	0.1	0.1	0.2	0.2
142601	Surveying/Mapping Sci	0.8	0.6	1.3	1.0
142701	Systems Engineering	0.3	0.7	0.6	1.4
145001	Engin Graphics/Drawing	2.6	3.8	3.1	6.0

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
147001	Engin Math & Statistics	0.9	2.8	1.2	5.3
148001	Engin Co-Op/Internship	N.A.	0.1	N.A.	0.3
149001	Engin Prof Practice Reg	N.A.	<0.1	N.A.	0.1
149999	Engineering: Other	1.1	1.7	1.8	2.9
	Engineering Technologies				
150101	Archit Design/Const Tech	1.1	0.7	1.1	0.8
150103	Construct Mater/Methods	N.A.	0.7	N.A.	0.7
150201	Civil Technologies	0.8	1.1	0.8	1.4
150202	Drafting/Design Technol	1.1	1.3	1.1	0.5
150203	Surveying/Mapping Techn	0.6	0.5	0.3	0.3
150301	Computer Technol	1.0	3.1	0.6	3.4
150303	Electronic/Electric Techn	4.8	5.1	3.7	5.0
150304	Laser/Optical Electronics	N.A.	0.3	N.A.	0.5
150305	Solid State Technol	N.A.	0.5	N.A.	0.4
150399	Elect/Electronic Tech: Oth	0.3	0.8	0.3	0.6
150403	Electromechanical Technol	0.6	1.1	0.5	1.5
150404	Instrumentation Technol	0.7	1.0	0.9	1.4
150405	Robotics, Robotics Tech	N.A.	0.5	N.A.	0.7
150501	Heating & Cooling Technols	0.4	0.5	0.3	0.6
150506	Water & Wastewater Technol	0.4	0.1	0.6	0.1
150599	Envir Control Techs: Other	0.4	0.2	0.6	0.3
150603	Industrial Technology	0.6	1.0	0.5	1.5
150604	Manufacturing Technology	0.7	1.7	0.8	2.4
150610	Welding Technology	0.7	0.2	0.4	0.1
150699	Industrial Prod Tech: Oth	0.3	0.2	0.4	0.4
150701	Indust Safety/Safety Tech	0.6	0.7	0.6	0.9
150702	Quality Control Technol	0.3	0.5	0.3	1.0
150801	Aeronautical Technology	0.4	0.5	0.5	0.8
150803	Automotive Technology	0.6	0.4	0.6	0.4
150805	Mechanical Design Technol	0.7	1.0	0.7	1.4
150899	Mechanical Technols: Oth	0.4	0.2	0.4	0.2
150903	Petroleum Technology	<0.1	0.1	0.1	0.1
151101	Technical/Applied Physics	N.A.	0.6	N.A.	0.3
159001	Engineering Technol: Gen.	0.3	0.4	0.3	0.4
159999	Engin. Tech.: Other	0.6	0.4	0.5	0.4

Table 5.1.-Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
	Languages Other Than English				
160301	Chinese: Intro & Intermed	0.3	0.2	0.5	0.4
160302	Japanese: Intro & Intermed	0.2	0.6	0.3	0.9
160321	Chinese: Advanced, Lit	<0.1	<0.1	0.1	<0.1
160322	Japanese: Advanced, Lit	<0.1	0.1	<0.1	0.2
160402	Russian: Intro & Intermed	0.7	0.7	1.0	1.1
160403	Other Slavic Languages	0.1	<0.1	0.1	0.1
160422	Russian: Advanced, Lit	0.2	0.2	0.4	0.4
160501	German: Intro & Intermed	5.4	3.7	9.1	6.6
160502	Scandinavian Langs: All	0.1	0.1	0.3	0.2
160521	German: Advanced, Lit.	0.9	0.5	1.8	0.9
160601	Greek: Classical	0.5	0.4	1.0	0.7
160901	French: Intro & Intermed	8.5	7.6	14.0	12.9
160902	Italian: Intro & Intermed	1.2	1.6	2.0	3.0
160903	Latin	0.7	0.9	1.3	1.4
160904	Portuguese: All	0.2	0.1	0.3	0.1
160905	Spanish: Intro & Intermed	12.3	13.3	18.0	20.4
160921	French: Advanced, Lit.	1.5	1.6	3.0	3.1
160922	Italian: Advanced, Lit	0.1	0.2	0.1	0.4
160925	Spanish: Advanced, Lit	1.6	1.5	2.7	3.0
160935	Spanish for Native Speak	0.2	0.2	0.2	0.1
161001	Native American Langs	0.1	0.1	0.1	<0.1
161101	Arabic: All	0.1	0.1	0.2	0.1
161102	Hebrew: All	0.4	0.2	0.7	0.5
169999	Foreign Langs: Other/Indet	0.4	0.8	0.7	1.3
	Allied Health Sci/Services				
170101	Dental Assisting	0.3	0.6	0.2	0.2
170102	Dental Hygiene	0.3	0.3	0.3	0.2
170103	Dental Lab Technol	0.2	0.6	0.2	0.1
170104	Oral/Dental Radiology	0.2	0.5	0.1	0.1
170199	Dental Services, Other	0.2	0.4	0.1	0.1
170201	Cardiovascular Technol	0.2	0.3	0.1	0.1
170202	CPR/First-Aid	N.A.	0.7	N.A.	0.7
170206	Emerg Medical/Paramedic	0.9	2.0	1.2	2.2

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
170209	Radiologic (Med) Technol	0.5	0.5	0.3	0.3
170210	Respiratory Therapy Tech	0.1	0.2	<0.1	0.2
170211	Surgical Technology	0.1	0.1	0.1	0.1
170301	Blood Bank/Hematology Tech	0.3	0.4	0.5	0.4
170303	Clinical Animal Technology	0.1	0.1	<0.1	0.1
170309	Medical Lab Technologies	0.8	0.9*	0.6	0.8*
170311	Microbiol Tech	0.5	0.4	0.5	0.4
170312	Med Imaging, Ultrasound	N.A.	0.2	N.A.	0.1
170401	Alcohol/Drug Abuse Treatmnt	1.0	1.3	1.8	1.7
170402	Community Health/Hygiene	3.9	3.2	5.0	4.5
170405	Mental Health Assisting	0.1	0.2	0.1	0.3
170410	Sign Lang. Interp./AMESLAN	0.6	1.5	0.7	1.9
170503	Medical/Physician Assist	0.3	0.3	0.1	0.1
170505	Medical Office Management	0.4	0.6	0.1	0.1
170506	Medical Records Technology	0.3	0.2	0.1	0.2
170507	Pharmacy Assisting	0.1	0.3	0.1	0.2
170599	Allied Health Servs.: Oth	0.2	0.2	0.2	0.2
170605	Practical Nursing	0.6	0.9	0.2	0.3
170701	Opthalmic Servs. & Techn	0.1	0.1	0.1	0.2
170801	Art/Music/Dance Therapy	0.1	0.1	0.1	0.1
170804	Kinesiology/Exercise Physio	2.7	1.8	4.6	3.2
170807	Occupational Therapy	0.2	0.1	0.3	0.1
170813	Physical Therapy	0.4	0.5	0.5	0.8
170816	Recreational Therapy	0.4	0.4	0.5	0.4
170899	Rehabil. Servs.:Other	0.5	0.3	0.8	0.7
170901	Health Servs. & Sci.: Gen.	3.6	4.9	4.0	6.5
171001	HPER: Intro., General	1.9	0.9	3.0	1.4
171002	Athletic Injuries/Training	1.1	1.2	1.8	2.3
171003	Adaptive Physical Educat	0.9	0.7	1.7	1.3
172001	Medical Terminology	0.9	2.9	0.5	2.1
178001	Health Assessment/Wellness	N.A.	0.9	N.A.	1.3
179001	Clinic Practicum	N.A.	0.3	N.A.	0.2
179999	Allied Health: Other	0.7	0.5	0.8	0.7
180101	Audiology	0.8	0.4	1.4	0.7
180102	Speech Pathology	1.4	0.4	2.6	0.8
180103	Speech-Lang Pathol/Audiol	0.8	0.6	1.5	0.9
180199	Audiol & Speech Path: Oth	0.5	0.2	1.0	0.3

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
	Clinical Health Sciences				
180201	Clinical Anatomy	0.5	0.8	0.6	0.6
180202	Clin/Med/Physio. Biochem	0.3	0.4	0.6	0.7
180203	Clin. Microbio/Med Bacter.	0.9	1.0	1.4	1.7
180204	Clinical Pathology	0.3	0.4	0.5	0.4
180205	Clinical Physiology	0.5	0.3	0.8	0.5
180299	Clinical Health Sci: Other	0.3	0.5	0.5	0.5
	Health Professions				
180301	Chiropractic	<0.1	0.1	0.1	0.1
180402	Prevent. Dentistry	0.3	0.4	0.3	0.2
180405	Oral Pathology	0.2	<0.1	0.2	0.1
180701	Health Servs/Hospit Admin	0.6	0.5	0.9	0.8
180702	Health Care Planning	0.3	0.3	0.4	0.6
180799	Health Servs Admin: Oth	0.2	0.1	0.3	0.2
181001	Medicine: General	0.4	0.2	---	0.4
181003	Anesthesiology	0.1	0.1	0.1	0.2
181009	Immunology	0.7	0.7	1.4	1.4
181018	Pathology	0.1	0.3	0.2	0.5
181025	Radiology	0.2	0.1	0.2	0.2
181029	Hematology	0.1	0.1	0.1	0.2
181099	Medicine: Other	0.3	0.2	0.5	0.5
181101	Nursing: General	4.9	3.5	3.8	3.2
181103	Maternal/Pediatric Nursing	2.7	1.4	1.9	1.1
181104	Medical/Surgical Nursing	2.2	1.6	1.3	1.2
181105	Nursing Admin.	0.4	0.7	0.7	1.2
181106	Psychiat/Mental Hlth Nurs	2.3	1.3	2.1	1.1
181107	Pub/Community Hlth Nurs	1.6	0.7	2.7	1.1
181108	Nursing Research	N.A.	0.9	N.A.	1.9
181109	Geriatric/Gerontol Nurs	N.A.	0.1	N.A.	0.3
181110	Life-Cycle Nursing	N.A.	0.3	N.A.	0.5
181199	Nursing: Other, Indet	2.9	1.3	2.6	1.7
181201	Optometry	<0.1	0.1	0.1	0.1
181401	Pharmacy	1.0	0.4	1.7	0.6
182201	Public Health Lab Sci	0.3	0.3	0.5	0.5

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning > 10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
182204	Pub Health Practice/Mgmt	0.3	0.1	0.4	0.2
182299	Envir/Int'l Pub Health	0.2	0.2	0.3	0.2
182401	Veterinary Medicine	0.3	0.1	0.4	0.1
	Home Economics				
190101	Home Economics: General	0.9	0.3	1.4	0.6
190201	Bus Home Ec/Family Finance	0.7	0.7	1.2	1.3
190401	Family/Consumer Mgmt. Gen	0.7	0.7	1.2	0.8
190402	HE: Consumer Science	2.0	1.9	3.5	2.6
190501	HE: Food Sci/Nutrit: Gen.	3.1	5.0	3.8	6.9
190502	HE: Food & Food Sciences	1.2	0.6	1.9	0.8
190503	Dietetics/Nutrit. Servs	0.9	1.7	1.1	1.5
190504	HE: Human Nutrition	4.7	3.2	5.9	4.7
190599	HE: Food Sci/Nutrition:Oth	0.1	0.3	0.2	0.6
190601	HE: Human Envir/Housing	0.3	0.3	0.6	0.5
190602	Household Equip/Furniture	0.4	0.5	0.7	0.7
190701	HE: Indiv/Family Devel	3.5	1.5	5.2	1.9
190703	HE: Family Counseling	0.3	0.4	0.4	0.6
190704	HE: Family Relations	3.9	2.0	5.8	3.4
190705	HE: Gerontological Servs	0.1	0.4	0.2	0.6
190901	Textiles & Clothing: Gen	1.3	1.1	1.7	1.7
190902	Fashion Design	0.7	1.1	0.8	1.4
190904	Textile Science	0.7	0.6	1.0	0.7
190999	Textiles & Clothing: Other	0.3	0.2	0.4	0.5
199999	Home Economics: Other	0.5	0.4	0.9	0.9
	Vocational Home Economics				
200102	VHE: Child Development	5.7	2.7	7.5	3.2
200103	Cloth Select, Ready-to-Wear	0.8	0.2	1.0	0.3
200106	VHE: Family/Indiv Health	0.7	0.3	1.1	0.4
200107	VHE: Family Living/Parent	2.2	0.6	2.9	0.7
200108	VHE: Food & Nutrition	0.7	0.2	1.2	0.4
200201	VHE: Child Care Services	0.5	0.3	0.4	0.1
200303	Garment/Apparel Construct	0.3	0.7*	0.4	1.1*
200306	Fashion/Fabric Coordin	0.3	0.1	0.2	0.1

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
200401	Food Production/Mgmt/Servs	0.7	0.9	0.9	0.9
200402	Baking	0.2	0.2	0.0	<0.1
200403	Chef/Cook	0.3	0.2	0.1	<0.1
200406	Food Service & Catering	0.7	0.5	0.8	0.6
200499	Food Mgmt/Servs: Other	0.2	0.4	0.2	0.3
200504	Floral Design	0.3	0.2	0.4	0.3
200505	Home/Interior Decorating	0.2	0.4	0.4	0.5
209999	Vocat. Home Econ.: Other	0.2	0.2	0.3	0.2
	Industrial Arts				
210104	Basic Electricity/Electron	0.7	0.8	0.1	0.2
210106	Basic Mechan Drawing	0.5	0.3	0.5	0.1
	Law				
220101	Law: Gen., Law & Society	N.A.	2.4	N.A.	3.8
220301	Para-Legal, Legal Research	0.4	1.0	0.3	0.5
220302	Law Office Management	N.A.	0.2	N.A.	0.1
220401	Military Law	N.A.	0.2	N.A.	0.5
220501	International Law	N.A.	0.3	N.A.	0.5
229999	Law: Other	2.8	2.8	4.2	4.7
	English and Letters				
230101	Literature: General/Intro	20.5	15.2	31.1	24.5
230102	Poetry: General/Intro.	2.4	2.1	3.8	4.4
230103	Fiction: General/Intro.	7.3	6.9	12.0	12.1
230104	Drama: General/Intro.	2.5	1.7	4.1	2.9
230105	Non-Fict. Prose, Biog.	0.6	0.9	1.0	1.9
230201	Classical Literature	3.4	2.9	6.2	5.5
230202	The Bible as Literature	0.9	2.4	1.5	3.9
230301	Compar Lit.: European	3.1	2.0	5.7	3.6
230302	Compar Lit.: Non-Western	0.6	0.4	1.1	0.8
230401	Freshman Composition	63.5	67.5	73.6	79.8
230402	Spoken/Written Eng/Grammar	1.9	3.0	1.9	4.3
230403	Writing Proficiency Exam	N.A.	0.2	N.A.	0.1

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

Code	Field/Course	All Students Earning >10 Credits NLS-72	All Students Earning >10 Credits HS&B/So	All Bachelor's Degree Students NLS-72	All Bachelor's Degree Students HS&B/So
230501	Creative Writing	4.6	3.4	7.3	5.9
230601	Linguistics	4.9	3.5	8.8	6.7
230701	American Literature	13.9	10.0	23.1	18.6
230702	Afro-American Literat	0.9	0.7	1.3	1.3
230801	English Lit: All Periods	9.9	7.1	16.5	13.4
230802	Shakespeare	3.8	3.6	7.1	7.4
231001	Pub Speaking, Debate	10.9	13.0	15.9	19.5
231002	Voice & Articulation	1.7	1.5	2.7	2.4
231101	Technical Writing	6.4	11.2	7.8	16.7
231102	Advanced Essay/Argument	N.A.	3.8	N.A.	7.0
231301	Criticism, Literary Hist	1.0	1.6	1.9	3.1
232001	Remedial English/Writing	13.2#	18.7#	9.6#	13.7#
232002	Basic Reading	7.2#	9.5#	5.7#	6.7#
232003	Remedial/Basic Speech	2.0#	2.1#	2.7#	2.2#
232004	ESL	0.2	0.2	0.2	0.2
233001	Speed Reading	N.A.	1.1	N.A.	1.1
239001	Other Determin Lit. Topics	3.7	4.9	6.0	9.5
239002	Science Fiction, Fantasy	1.1	1.3	1.8	2.6
239003	Folklore, Mythology	1.1	1.6	2.0	2.8
239004	Lit. & Film/Film as Lit	0.5	1.0	1.0	1.4
	Liberal Arts/General Studies				
240101	Liberal Arts & Sciences	0.9	3.5	1.6	5.9
240102	Gen Studies, Core Curric	0.8	1.0	1.0	1.5
240103	Critical Thinking	N.A.	2.2	N.A.	3.2
	Library/Archival Sciences				
250101	Library/Archival Sci	0.6	0.4	0.9	0.6
250401	Cataloguing, Classific	0.1	0.1	0.1	0.1
250501	Museology, Archival Sci	0.1	0.1	0.3	0.2
	Biological Sciences				
260101	Biology: General	34.8	25.0	47.3	35.4
260102	Human Biology	2.7	3.3	3.3	4.7

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

Code	Field/Course	All Students Earning >10 Credits NLS-72	All Students Earning >10 Credits HS&B/So	All Bachelor's Degree Students NLS-72	All Bachelor's Degree Students HS&B/So
260201	Biochemistry	3.8	2.8	7.3	5.5
260202	Biophysics	0.2	0.3	0.3	0.6
260301	Botany: General	5.9	3.3	9.0	5.1
260307	Plant Physiol/Morphol/Chem	0.9	0.3*	1.9	0.7*
260310	Plant Taxonomy/Systematics	0.8	0.4	1.4	0.8
260399	Botany: Other	0.8	0.2	1.3	0.4
260401	Cell Biology	2.4	2.0	4.5	3.8
260402	Molecular Biology	0.5	0.4	1.1	0.8
260501	Microbiology	8.1	6.0	10.9	7.5
260502	Bacteriology	1.3	0.7	2.2	0.9
260601	Anatomy: Plant and Animal	4.8	0.8	7.5	1.4
260602	Biometrics, Biostatistics	0.6	0.7	1.1	1.2
260603	Ecology	5.4	4.1	9.5	7.1
260604	Embryology, Develop Bio	1.9	0.6	3.7	1.4
260605	Endocrinology	0.3	0.2	0.6	0.3
260606	Histology	1.0	0.6	1.4	1.0
260607	Marine Bio, Limnology	1.0	0.9	1.7	1.1
260608	Neurosciences	0.3	0.7	0.7	1.6
260610	Parasitology	0.9	0.5	1.6	0.8
260612	Toxicology	0.3	0.2	0.6	0.4
260613	Evolution	1.6	1.7	3.2	3.4
260614	Field Biol/Botany/Nat Hist	1.0	1.0	1.8	2.0
260615	Genetics:Human/Animal/Plant	5.6	3.3	10.7	6.7
260699	Misc Spec Life Sci.: Oth	0.8	0.5	1.3	1.0
260701	Zoology: General	8.2	4.8	13.0	7.4
260702	Entomology	1.2	0.4	2.0	0.5
260704	Pathology:Human/Animal	0.6	0.1	0.9	0.1
260705	Pharmacology:Human/Animal	1.8	2.0	2.1	1.6
260706	Physiology:Human/Animal	6.1	4.9	10.3	8.3
260707	Animal Behavior, Ethology	0.9	0.8	1.8	1.3
260708	Ornithology	0.3	0.2	0.6	0.3
260799	Zoology: Other	1.0	0.3	1.7	0.5
260801	Anatomy & Physiology	8.7	10.6	8.2	10.7
260802	Plants & Envir/Civiliz	0.6	0.2	1.1	0.4
260803	Pathophysiology	0.6	1.4	0.7	2.0
260804	Organic Biochemistry	0.8	1.4	1.3	2.2
260805	Human Growth & Devel	3.6	4.4	4.6	5.6

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
262001	Life Sci for Lib Arts	N.A.	2.8	N.A.	4.1
269999	Life Sci: Oth, Indeterm	3.1	1.9	5.2	2.8
	Mathematics				
270101	Pre-Collegiate Math: Gen	12.6#	8.3#	14.7#	6.7#
270102	Arithmetic	2.0#	2.5#	1.8#	1.1#
270103	Pre-Colleg. Algebra	10.4#	17.9#	8.7#	16.8#
270104	Plane Geometry	1.2#	0.7#	1.5#	1.2#
270199	Developmental Math: Oth	2.8#	2.0#	3.0#	1.3#
270201	Liberal Arts Math	8.2	8.5	9.9	10.3
270202	Finite/Discrete Math	4.0	6.5	6.1	11.0
270203	College Algebra	15.0	21.3	18.4	27.6
270204	Pre-Calculus, Analyt Geom	12.2	14.8	18.7	24.0
270501	Statistics, Probability	13.7	16.8	23.3	30.4
270502	Advanced Statistics	N.A.	1.4	N.A.	2.6
270601	Calculus	16.3	17.6	26.9	33.8
270602	Calc for Life Sci, Econ	1.9	3.0	3.3	5.3
270701	Adv College Math Topics	2.4	4.2	5.1	8.3
270801	Technical/Vocational Math	3.6	5.3	1.3	2.4
270901	Business Math:Pre-Colleg	5.9#	6.2#	2.2#	2.5#
270902	Business Math:Collegiate	3.1	5.2	3.9	5.8
271001	Number Systems/Structures	0.8	1.6	1.2	2.6
272001	Cultural Mathematics	N.A.	0.2	N.A.	0.3
279999	Math: Other, Indetermin	6.7	2.2	8.3	2.9
	Military Science				
280101	Aerospace Sci (Air Force)	0.8	0.8	1.2	1.4
280301	Military Sci (Army)	1.2	2.0	1.9	3.1
280401	Naval Sci (Navy,Marines)	0.5	0.5	1.0	0.9
289999	Military Science: Other	0.5	0.8	0.9	1.3
	Inter/Multi-Disciplinary				
300101	Gen. Science, Nat. Sci.	3.4	2.9	4.6	4.5
300102	Gen. Laboratory, Instrument	0.2	0.7	0.3	1.1

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	**Field**/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
300103	Intro Technol/Applied Sci	0.5	0.4	0.5	0.5
300201	Clinical Pastoral Care	0.2	0.1	0.2	0.1
300401	Humanities: General	7.7	7.1	10.7	10.1
300402	Humanities & Social Sci	1.1	1.2	1.7	2.2
300403	Humanities & Arts	1.1	1.4	1.5	2.3
300404	Popular Culture	0.6	0.9	0.9	1.7
300501	Peace Studies	0.7	0.7	1.2	1.4
300701	Womens Studies: Gen	3.5	3.9	6.0	7.1
300702	Women in Lit/Art/Film	N.A.	0.7	N.A.	1.3
300703	Women's Psychology	N.A.	0.5	N.A.	0.8
300709	Gender Studies	N.A.	1.0	N.A.	1.9
301001	Future Studies, Futurist	0.4	0.3	0.7	0.6
302001	Sci, Technol, & Society	2.5	2.8	4.3	5.2
302002	Bioethics, Biomed Ethics	N.A.	1.0	N.A.	1.6
303001	Environmental Studies	4.7	3.6	7.6	6.3
303002	Environmental Sci/Technol	N.A.	0.9	N.A.	1.5
304001	Sports/Leisure Studies	1.1	1.5	2.0	2.9
309999	Interdisc. Studies: Other	1.3	0.4	2.3	0.8
	Recreation				
310101	Recreation/Parks: General	0.8	0.8	1.1	1.4
310201	Outdoor Recreat.,Camp Couns	1.6	1.9	2.4	3.4
310301	Parks/Recreation Managemnt	1.0	0.6	1.4	1.0
310401	Water Recreation/Safety	0.2	1.0	0.3	1.7
310501	Sports Officiating	1.2	1.2	1.5	1.8
310601	Recreat. Leadership	0.4	0.6	0.5	1.1
310901	Recreat. Practicum	0.4	0.3	0.6	0.7
319999	Recreat./Parks: Other	0.5	0.3	0.9	0.6
	Basic Skills				
320101	Student Development	0.3#	1.1#	0.4#	1.2#
320102	Academic/Intellect. Skills	2.1#	4.1#	1.9#	3.6#
320104	Workplace/Job Skills	N.A.	0.3	N.A.	<0.1
320105	Job Seeking Skills	1.8	4.5	1.2	4.6
320107	Career Explor./Orientation	0.4	3.8	0.4	4.2

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning > 10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
320108	Typing as Basic Skill	1.3	2.5	1.7	2.4
320109	Library Skills/Orientation	N.A.	1.6	N.A.	2.3
	Student Activities & Service				
330101	Student Activities/Publics	N.A.	0.2	N.A.	0.2
330201	Student/Community Service	N.A.	0.3	N.A.	0.5
330301	Assemblies, Convocations	N.A.	0.1	N.A.	0.2
	Health & Personal Development				
340101	Health/Phys Practice: Gen	13.8	9.0	16.4	11.2
340102	Sex & Birth Health Pract.	0.7	0.3	1.0	0.4
340103	Mental Hygiene	0.9	0.5	1.4	0.9
340104	Aerobics,Jogging,etc	9.8	19.1	12.1	24.7
340105	First Aid/Safety/Self-Help	9.4	7.3*	12.0	8.0*
340106	Drug/Alcoh Abuse Prevent	1.1	1.5	1.9	2.3
340107	Adapted Physical Educat	0.3	0.4	0.4	0.6
340108	Life-Saving, Red Cross	N.A.	0.9	N.A.	1.5
350101	Interpers Skills	4.9	5.7	3.9	4.4
350102	Relations: Love/Sex/Job	1.2	1.5	1.6	1.8
350104	Assertiveness,Leadership	0.6	2.6	0.8	3.6
360101	Leis/Recreat. Activs: Gen	1.4	1.1	1.8	2.0
360103	Games	1.1	0.6	1.4	0.9
360108	Physical Education Activs	53.3	40.2	66.6	55.9
360110	Self-Defense,Karate,etc.	3.1	3.3	3.7	5.0
360111	Equestrian Activities	0.7	0.5	0.9	0.6
360112	Yoga, Meditation	0.8	0.7	1.1	1.2
360113	Scuba/Skin Diving	1.2	0.9	1.6	1.3
360115	Riflery, Pistol	0.4	0.6	0.5	0.9
360201	Varsity Ath:Major Sports	1.1	0.9	1.5	1.3
360202	Varsity Ath:Minor Sports	1.2	1.7	1.5	2.2
369999	Recreat/Leis Activs: Oth	0.6	0.5	0.9	0.9
370101	Self-Awareness	2.8	2.8	2.4	2.6
370102	Coping Skills	0.5	1.2	0.6	1.9
370103	Pers Decision-Making	0.4	0.6	0.4	0.9

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont"d)

		All Students Earning > 10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
370104	Appearance, Charm, etc.	1.7	0.5	1.2	0.1
370105	Personal Values	0.2	0.2	0.3	0.4
	Philosophy				
380101	Intro. Philosophy	15.2	14.5	22.8	23.5
380102	Ethics, Moral Phil	6.6	8.6	10.5	14.9
380103	Logic, Formal Reasoning	7.6	8.1	12.7	14.3
380104	Aesthetics, Phil. of Art	0.8	0.9	1.4	1.9
380105	Metaphysics, Epistemol	1.0	1.4	1.9	2.6
380106	Philosophy of Language	0.5	0.2	0.9	0.3
380110	Hist of Philosophy: Gen	0.9	0.9	1.6	1.9
380111	Ancient & Medieval Phil	1.1	0.9	1.8	1.7
380112	Phil: Rennais thru 19th C.	0.8	0.5	1.5	0.8
380113	Contemp Phil:Analyt,Exist	1.1	1.3	2.1	2.2
380114	Non-Western Philosophy	0.5	0.3	0.8	0.8
380120	Philosophy of Education	0.9	0.2	1.7	0.4
380121	Phil of Sci, Sci. Method	0.8	0.4	1.5	0.9
380122	Philosophy of Religion	1.1	1.2	1.7	2.5
380123	Philosophy of Law	N.A.	0.5	N.A.	1.0
380199	Philos: Indeterm, Other	6.3	1.7	10.3	3.1
	Religious Studies				
380201	Religion:Gen.,Compar	7.4	6.4	12.3	11.3
380202	Non-Western Religions	1.1	0.8	2.0	1.5
380203	Mormon Texts and Hist	0.5	0.5	0.5	0.6
380204	Christianity: all Topics	2.0	3.2	3.4	5.7
380205	Judaism: all Topics	0.5	0.4	0.9	0.9
380206	Religious Ethics/Morality	0.5	0.9	0.9	1.7
389999	Phil & Religion: Other	1.1	0.5	2.0	1.2
	Theology				
390101	Biblical Langs.:Seminary	0.4	0.3	0.7	0.6
390201	Bible Studies	7.7	6.0	11.6	9.6
390301	Missionary Studies	0.6	0.5	0.8	0.5

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning > 10 Credits		**All Bachelor's Degree Students**	
Code	**Field**/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
390401	Religious Education	0.9	0.5	1.3	0.9
390501	Religious Music	0.4	0.2	0.5	0.4
390601	Theological Studies	3.2	2.1	5.1	3.9
390701	Christian Living/Activs	1.3	0.9	2.0	1.5
399999	Theology: Other	0.7	0.4	1.2	0.8
	Physical Sciences				
400101	Physical Sci.: General	9.9	5.7	13.8	8.6
400201	Astronomy	9.0	9.1	14.4	14.9
400301	Astrophysics	0.2	0.4	0.4	0.7
400401	Meteorology	3.0	2.1	5.1	3.5
400501	Chemistry: General	25.4	22.8	35.5	35.6
400502	Analytical Chemistry	3.1	2.5	5.6	5.1
400503	Inorganic Chemistry	2.2	1.1	3.4	1.7
400504	Organic Chemistry	8.2	5.4	15.1	10.6
400505	Pharmaceutical Chem	0.5	0.2	0.9	0.5
400506	Physical Chemistry	1.4	1.2	2.9	2.6
400509	Chemistry: Other Topics	1.0	1.1	1.7	2.0
400510	Chem: Research	0.3	0.2	0.6	0.5
400520	Applied Chemistry	1.8	1.4	2.6	1.8
400530	Chem. for Nursing/Health	0.5	0.7	0.5	0.8
400599	Chem.: Other, Indeterm.	0.7	0.5	1.1	0.8
400601	Geology: General	10.6	6.8	16.5	11.4
400602	Geochemistry	0.2	0.2	0.3	0.4
400603	Geophysics & Seismology	0.7	0.3	1.2	0.6
400604	Paleontology	0.9	0.6	1.7	1.2
400605	Mineralogy, Petrology	0.6	0.5	1.1	0.8
400699	Geological Sci.: Other	0.6	0.7	1.1	1.2
400701	Metallurgy	0.4	0.1	0.3	0.2
400702	Oceanography	2.7	2.1	4.4	3.1
400703	Earth Science	4.8	4.3	7.2	6.8
400801	Physics: General	16.6	14.2	26.3	24.7
400802	Atomic/Nuclear Physics	0.6	0.5	1.3	0.9
400807	Optics	0.3	0.7	0.5	1.3
400809	Acoustics	0.4	0.3	0.8	0.6
400810	Thermal Sci/Thermodynamics	1.5	1.3	2.8	2.7

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

Code	Field/Course	All Students Earning >10 Credits		All Bachelor's Degree Students	
		NLS-72	HS&B/So	NLS-72	HS&B/So
400811	Elect & Magnet:Intermed	0.8	1.0	1.4	2.0
400812	Modern Physics	0.4	0.7	0.8	1.4
400813	Classical Mechanics	0.5	0.8	0.7	1.6
400814	Quantum Physics	0.2	0.4	0.4	0.8
400820	Physics for Poets	N.A.	0.9	N.A.	1.5
400830	Physics w/Calculus	N.A.	0.5	N.A.	1.0
400899	Physics: Other	1.1	1.0	1.7	1.7
400901	Planetary Science	0.2	0.7	0.4	1.2
410101	Science Technologies: All	N.A.	0.7	N.A.	1.0
	Psychology				
420101	Psychology: Gen., Intro.	56.3	53.7	69.7	65.8
420201	Clinical Psychology	1.4	1.4	2.5	2.2
420301	Cognitive Psychology	2.9	1.9	5.4	3.7
420601	Counseling/Community Psych	1.0	1.0	1.6	1.8
420701	Developmental Psych	16.7	13.4	25.6	19.8
420801	Experimental Psych	2.7	2.2	5.0	4.4
420901	Indust & Organiz. Psych	1.7	2.1	2.8	3.5
421001	Personality Psychology	9.0	8.2	14.6	12.0
421002	Abnormal Psychology	8.6	7.0	15.0	12.1
421003	Human Sexuality	2.3	6.8	3.7	11.2
421101	Physiological Psych	2.2	2.1	3.9	4.1
421201	Psycholinguistics	0.6	0.6	1.3	1.1
421301	Psychometrics	1.0	0.5	1.9	1.0
421401	Psychopharmacology	0.3	0.4	0.7	0.7
421501	Quantitative Psych	1.9	1.8	3.4	3.7
421601	Social/Environ Psych	10.6	7.2	17.3	12.7
422001	History of Psychology	1.0	0.8	1.7	1.7
429010	Psych Field Work	0.4	0.6	0.8	1.0
429020	Psych Seminars, Readings.	1.6	0.7	3.0	1.4
429999	Psych: Other, Indet	3.8	2.7	6.2	4.1
	Protective Services				
430101	Correctional Admin	0.3	0.6	0.3	0.6
430102	Penology,Probat/Parole	1.3	0.7	1.7	0.8

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning > 10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
430103	Criminal Just. Admin	1.4	1.4	1.3	1.4
430104	Criminal Just Studies	1.7	4.2	2.1	5.0
430105	Criminalistics	1.6	1.7	1.3	1.4
430106	Forensic Studies	0.2	0.1	0.2	0.2
430107	Gen. Police Training	2.3	1.4	1.9	1.1
430108	Law Enforcement Admin.	1.0	0.9	1.1	0.7
430109	Security Services	0.1	0.3	0.1	0.2
430110	Police Field Experience	0.4	0.4	0.5	0.4
430120	Criminal Procedure	0.9	1.8	1.1	1.2
430130	Police/Community Relat	0.4	0.8	0.4	0.6
430140	Traffic Law/Mgmt	0.6	0.5	0.3	0.3
430150	Juvenile Justice	0.9	2.0	1.0	2.8
430160	Drug Enforcement	0.2	0.2	0.2	0.1
430199	Criminal Justice: Other	0.3	0.5	0.4	0.6
430201	Fire Control Technology	0.3	0.4	0.1	0.1
430202	Fire Protection Admin.	0.1	0.2	---	0.1
430203	Firefighting	0.1	0.2	<0.1	0.1
430299	Fire Protection: Other	0.1	0.2	<0.1	0.1
	Public Affairs				
440101	Human Services: General	N.A.	0.5	N.A.	0.5
440201	Community Serv/Organiz.	1.0	0.6	1.5	0.9
440301	Intl Organizats/Serv	0.4	0.3	0.8	0.6
440401	Public Administration	1.7	1.3	3.2	2.8
440501	Public Policy Studies	1.2	1.4	2.3	2.8
440601	Public Works	0.3	0.2	0.4	0.4
440701	Social Work: General	3.1	1.8	5.1	2.6
440703	Social Welfare	0.5	1.2	1.0	2.2
440710	Social Work Practicums	0.3	0.7	0.6	1.0
440720	Research in Soc Welfare	0.1	0.3	0.3	0.7
440799	Social Work: Other	0.3	0.4	0.5	0.7
449999	Public Affairs: Other	0.3	<0.1	0.5	<0.1

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning > 10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
	Anthropology & Other Social Sciences				
450101	Social Sciences: Gen	3.7	4.4	3.7	6.0
450201	Anthropol.: Gen, Intro	10.7	7.0	16.6	11.4
450202	Cultural Anthropology	7.5	6.3	11.4	10.1
450203	Physical/Biolog/Anthro	2.5	1.8	3.7	0.7
450204	Non-West Peoples & Cultures	0.3	0.4	0.5	0.7
450205	Native Amer (N&S) Peoples	0.7	0.6	1.1	1.1
450206	Linguistics & Culture	0.4	0.6	0.8	1.0
450210	Anthro Research, etc.	0.2	0.1	0.3	0.3
450299	Anthropology: Other	0.9	0.6	1.6	1.3
450301	Archaeology	1.3	1.1	2.4	2.1
450401	Criminology	5.3	3.2	8.3	4.7
450501	Demography	1.4	0.4	2.5	1.0
	Economics				
450601	Economy & Society	3.5	2.0	5.1	2.8
450610	Economics: Intro	31.3	38.4	44.8	58.7
450620	Intermed. Microeconomics	4.9	3.8	9.0	8.3
450630	Intermed. Macroeconomics	2.4	2.7	4.6	5.9
450641	Economic Statistics	1.2	2.2	2.3	4.7
450642	Econometrics, Forcecast	0.3	0.5	0.6	0.9
450651	Public Finance	0.8	1.5	1.6	3.0
450652	Intl Trade/Finance/Econ	0.8	2.1	1.7	4.5
450653	Monetary Theory	0.5	0.4	1.0	0.9
450654	Nat. Resource Economics	1.1	0.8	2.2	1.7
450655	Labor and Human Res Econ	1.4	1.1	2.8	2.5
450657	Money & Banking	4.9	5.5	8.9	11.4
450661	History of Econ Thought	0.5	0.6	0.9	1.3
450662	Comparative Econ Systems	0.7	0.8	1.4	1.7
450663	Econ Devel, 3rd Wrld Econ	0.5	0.6	0.9	1.2
450679	Economics:Oth Topics	2.2	1.5	3.9	2.9
450699	Economics:Other, Indet	0.7	0.4	1.5	0.9

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
	Geography				
450701	Geography: Gen, Combined	12.4	5.5	19.4	9.1
450702	Remote Sensing, Cartog	1.0	0.8	1.8	1.4
450703	Cultural Geography	1.7	2.7	2.6	4.7
450704	Physical Geography	5.0	4.8	8.0	7.4
450705	Economic Geography	1.1	1.0	1.8	1.9
450706	Urban Geography	0.6	0.5	1.1	1.0
450710	Geog of N. Amer/Anglo-Amer	2.1	1.2	3.8	2.1
450720	Geog. of Europe, USSR	0.3	0.3	0.6	0.5
450730	Geog. of Other World Areas	N.A.	0.3	N.A.	0.3
450760	Political Geography	N.A.	0.3	N.A.	0.5
450770	Quantitative Geography	N.A.	0.1	N.A.	0.1
450799	Geography: Other	0.4	0.7	0.7	1.3
	History				
450801	World Hist/Western Civ	21.9	18.9	29.3	28.3
450802	Ancient History	4.0	3.3	6.3	5.9
450803	Intell/Cult Hist: Non-U.S.	1.5	1.0	2.5	2.1
450804	Economic/Business History	1.5	0.8	2.7	1.8
450805	Hist of Relig/Church Hist	1.4	0.7	2.3	1.3
450808	Historiography, Methodol	1.0	0.4	1.9	0.9
450809	Hist of Sci, Math, Techn	1.3	1.1	2.4	2.0
450810	U.S. History Surveys	31.9	28.1	42.1	37.9
450811	U.S.:Topics thru Civ War	2.4	2.5	4.4	4.3
450812	U.S.:Topics since Civ War	1.4	2.0	2.6	3.5
450815	U.S. Cult/Intell History	1.6	1.2	2.8	2.1
450816	Hist of States/Regions	3.8	2.6	6.1	3.9
450817	Afro-American History	1.4	0.7	2.0	0.8
450819	U.S. Hist: Other	3.1	1.8	5.5	3.1
450821	Eur Hist: Middle Ages	1.5	1.1	2.7	2.2
450822	Eur Hist: Renn to 1789	2.8	1.0	5.1	1.8
450823	Eur Hist since 1789	3.6	2.8	6.3	5.0
450826	Hist of Indiv Countries	2.7	2.8	5.0	5.6
450829	Euro Hist: Other, Gen	2.3	1.7	3.9	3.2
450831	Asian History	1.7	0.8	2.9	1.6

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
450832	African History	0.6	0.4	1.0	0.8
450833	Latin American History	1.2	0.8	1.9	1.4
450839	Hist of Oth Wrld Regions	0.9	0.5	1.6	0.8
450870	Women's History	N.A.	0.8	N.A.	1.2
450880	Military History	N.A.	0.9	N.A.	1.6
450899	History: Other, Unknown	5.0	3.0	8.5	5.2
	Political Sciences				
450901	International Relations	3.5	4.4	6.2	8.8
451001	Polit Sci:Intro, Princs	8.2	6.8	12.1	11.0
451002	U.S. Govt & Politics	26.1	23.1	35.9	32.9
451003	U.S. Constit. Law/Hist	3.3	2.6	5.6	4.4
451004	Polit Theory/Ideology	2.9	3.1	5.3	6.0
451005	Comparative Govt & Pol	1.9	2.3	3.3	4.6
451006	European Govt & Pol	1.1	1.4	2.1	2.7
451007	Non-West Govt & Pol	1.0	1.5	1.8	3.0
451008	Methodology, etc.	0.6	0.4	1.1	0.7
451009	Polit. Behavior/Elections	1.9	1.5	3.5	2.9
451011	U.S. State/Local Gov & Pol	4.5	4.4	6.7	6.5
451012	U.S. Foreign Policy	1.7	2.5	3.1	5.2
451020	Pol Sci/Gov't Internship	N.A.	0.2	N.A.	0.4
451080	Pol Sci:Oth Determ Topics	1.0	1.8	1.9	3.4
451099	Pol Sci:Indeterminable	1.9	0.5	3.1	1.0
	Sociology				
451101	Sociol: Intro, Princs	39.1	35.2	49.9	45.7
451102	Marriage & Family	8.8	8.0	12.6	11.9
451103	Soc of Race/Ethnicity	3.1	2.1	5.0	3.8
451104	Organizat. Sociol	1.2	1.0	2.2	2.0
451105	Soc of Aging, Death	1.9	2.3	3.2	3.6
451106	Soc Change, Collective Beha	1.8	1.0	3.4	2.0
451107	Social Theory	2.0	1.0	3.6	1.8
451108	Comparative/3rd Wrld Soc	0.4	0.2	0.6	0.4
451109	Soc Problems, Deviance	10.4	6.5	15.3	9.3
451110	Sociol Research Methods	2.1	1.2	3.8	2.3

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
451111	Community/Rural/Urban Soc	2.2	1.1	3.9	1.9
451112	Social Stratif, Inequality	1.3	0.6	2.2	1.2
451113	Socialization	1.0	0.3	1.6	0.5
451114	Medical Sociology	N.A.	0.3	N.A.	0.5
451120	Applied Soc, Internships	0.4	0.2	0.7	0.5
451199	Sociol: Other, Indeterm	5.2	2.4	8.0	4.5
451201	Urban Studies	2.5	1.2	4.5	2.1
458001	Social Statistics	0.8	0.9	1.5	1.6
459999	Social Sci: Oth, Indet	2.1	0.2	3.5	0.3
	Building Trades				
460201	Carpentry	0.2	0.3	0.1	<0.1
460301	Elect/Power/Telecomm Inst	0.2	0.4	0.2	0.1
460302	Electrician	0.4	0.6	0.2	0.1
460401	Building Maintenance	0.1	<0.1	0.1	---
460503	Plumbing & Pipefitting	0.1	0.1	0.1	<0.1
460901	Construction Docs/Tools	N.A.	0.3	N.A.	0.2
469999	Building Trades: Other	0.2	0.3	0.1	0.1
	Mechanics and Repair				
470101	Elec/Electron Equip Repair	0.7	1.0	0.3	0.3
470103	Communic Electronics Rep	0.4	0.3	0.2	0.1
470104	Computer Electron Repair	0.2	0.3	0.1	0.1
470105	Industrial Electronics	0.3	0.4	0.2	0.2
470201	Heat/AC Mechanics: Gen	0.2	0.4	0.1	0.1
470202	Cooling & Refrigeration	0.3	0.6	<0.1	---
470203	Heating	0.2	0.2	0.1	---
470301	Industrial Equip Repair	0.2	0.2	0.1	---
470401	Mech,Hydr,Pneu Inst Rep	0.1	0.5	<0.1	0.1
470601	Mobile Equip Mechan: Gen	0.1	0.5	0.1	0.2
470602	Aircraft Mechanics	0.3	0.3	0.2	0.2
470603	Auto Body Repair	0.4	0.5	<0.1	0.1
470604	Automotive Mechanics	1.4	1.6	0.6	0.3
470605	Diesel Engine Mechanics	0.4	0.6	0.1	0.1
470699	Vehicle Mechanics: Other	0.2	0.3	<0.1	---

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

	All Students Earning >10 Credits		All Bachelor's Degree Students	
Code Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
Drafting, Graphic Communic.				
480101 General Technical Draft	1.8	1.8	1.1	1.1
480102 Architectural Drafting	1.1	1.3	1.0	1.3
480103 Civil/Structural Drafting	0.4	0.3	0.3	0.1
480104 Electrical/Electron Draft	0.5	0.4	0.2	0.2
480105 Mechanical Drafting	0.8	0.4	0.5	0.3
480199 Drafting: Other	0.2	0.2	0.1	0.1
480201 Graphic/Print Communic:Gen	0.8	1.3	1.1	1.6
480203 Commercial Art	0.8	0.8	0.7	1.2
480204 Commercial Photography	0.5	0.4	0.6	0.6
480205 Typesetting/Composition	0.5	0.7	0.6	0.8
480206 Lithography, Platemaking	0.5	0.4	0.7	0.6
480207 Photographic Lab	0.1	0.1	0.1	0.2
480208 Printing Press Operations	0.1	0.2	0.2	0.1
480209 Silk Screen Printing	0.4	0.3	0.5	0.4
480299 Graphic/Printing Comm: Oth	0.3	0.3	0.4	0.3
Other Precision Production				
480501 Precision Metal Work: Gen	0.4	0.3	0.2	0.2
480503 Machine Tools/Machine Shop	1.0	0.8	0.5	0.4
480504 Metal Fabrication	0.2	0.2	0.1	0.1
480507 Tool & Die Making	0.2	0.2	0.1	0.1
480508 Welding	1.7	1.8	0.5	0.3
480602 Jewelry Design/Fabricat.	0.2	0.2	0.2	0.2
480701 Woodworking/Cabinet/Mill	0.7	0.3	0.9	0.2
Transportation				
490101 Air Transport: General	0.3	0.6	0.2	0.9
490102 Airplane Piloting & Navig	0.6	0.5	0.7	0.5
490104 Aviation Management	0.2	0.4	0.2	0.5
490107 Airplane Piloting: Priv	0.2	0.3	0.2	0.3
490201 Vehicle & Equip. Operat	0.1	0.1	0.1	0.1
490301 Water Transport: All	0.1	0.1	0.1	0.1
499999 Transportation: Other	0.1	0.2	0.2	0.4

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

		All Students Earning >10 Credits		All Bachelor's Degree Students	
Code	Field/Course	NLS-72	HS&B/So	NLS-72	HS&B/So
	Fine, Applied and Performing Arts				
500101	Visual & Perf. Arts: Gen	2.3	2.7	3.3	4.1
500102	Visual Communications	0.7	1.4	1.1	2.3
500201	Crafts: General	1.2	0.4	1.7	0.6
500202	Ceramics	3.2	2.3	4.2	3.1
500204	Fiber/Textiles/Weaving	0.9	0.5	1.2	0.9
500206	Metal, Jewerly	0.7	0.3	1.1	0.4
500301	Dance	7.3	2.6	10.9	4.0
500302	History of Dance	0.2	0.2	0.3	0.3
500401	Design: Gen, 2D, 3D	4.9	4.3	6.3	6.2
500402	Graph Design/Arts/Letter	1.9	2.0	2.4	3.0
500403	Illustration Design	0.5	0.7	0.6	0.9
500404	Industrial Design	0.3	0.5	0.4	0.9
500405	Theater Design,Stagecraft	1.7	1.2	2.6	1.7
500499	Design: Other	0.9	0.5	1.3	1.0
500501	Drama Acting, Directing	6.0	5.3	8.9	8.5
500502	Hist of Theatre,Drama Crit	5.0	6.2	7.6	10.0
500601	Film Arts: General	3.0	3.0	5.0	5.2
500602	Cinematography/Film-Making	1.1	0.8	1.7	1.5
500605	Photography	4.3	4.9	5.4	7.7
500606	Video	0.1	0.5	0.1	0.8
500607	Hist of Film, Theory, Crit	1.9	3.2	3.3	6.2
500699	Film Arts: Other, Indeter	0.3	0.1	0.5	0.3
500701	Fine Arts: Gen, Theory	8.7	6.3	12.9	9.4
500703	Art History & Appreciat	15.4	13.4	22.2	21.9
500704	Arts Management	0.1	0.2	0.1	0.2
500705	Drawing	6.4	5.6	7.2	7.7
500708	Painting	2.8	2.2	3.6	3.1
500709	Sculpture	1.8	1.0	2.4	2.0
500710	Printmaking	0.8	0.6	1.1	1.2
500711	Color, Color Theory	0.6	1.5	0.8	2.4
500730	Non-West Art:Hist & Apprec	0.7	0.6	1.1	1.2
500740	History of Architecture	0.9	1.5	1.5	2.6
500799	Fine Arts: Other	2.1	1.5	3.1	2.7
500901	Music: Ear Training, etc.	9.8	6.3	14.9	10.3
500902	Music Hist & Apprec: Gen	10.8	11.3	16.0	17.8

Table 5.1.–Proportion of Students Earning Undergraduate Credits in Selected Courses (cont'd)

Code	Field/Course	All Students Earning >10 Credits		All Bachelor's Degree Students	
		NLS-72	HS&B/So	NLS-72	HS&B/So
500903	Music Performance	11.7	8.5	15.5	12.6
500904	Music Theory	3.9	2.2	5.5	3.6
500905	Music Literature	2.1	1.2	3.6	2.0
500906	Music History: Classical	1.3	1.1	2.3	2.1
500907	Music Hist:Opera/Mus Theat	0.2	0.5	0.4	0.9
500908	Music Hist:Jazz	1.2	1.8	1.8	2.6
500909	Music Hist:Pop/Rock/Folk	0.6	1.3	0.7	2.2
500910	Music Hist:Afro-Amer Mus	0.2	0.2	0.4	0.4
500920	Non-Western Music	0.2	0.2	0.3	0.3
500960	Business of Music	N.A.	0.2	N.A.	0.4
500999	Music: Other, Indetermin	1.6	0.9	2.7	1.6
509999	Visual & Perf Arts: Oth	0.3	0.2	0.4	0.4
	Other				
901000	Coop Educ: Fields Unspec	0.9	3.0	0.7	4.0
902000	Indep Study: Field Unspec	1.3	4.0	2.3	7.2
903000	College/Freshman Orient	5.6	6.6	4.7	6.8
904000	Senior Seminars/Theses	0.4	2.1	0.7	4.4
908000	Unclassifiable Titles	5.4	8.4	7.8	16.0

*** Course category was modified in ways that affect student participation rates.**

# Credits "earned" in these categories are usually non-additive, i.e. they do not count toward degrees. Just as often, courses in these categories do not carry credits at all. See Section 7 for a more accurate accounts of remedial coursework.

Table 5.2.–Percent of Students Earning Undergraduate Credits in 99 Aggregate Course Categories, High School & Beyond/Sophomore Cohort, 1982-1993

Universe: Only students who earned more than 10 credits are included. The weighted numbers for the High School & Beyond/So Transcript Samples are as follows: All: 1.83M; Men: 847k; Women: 992k; White: 1.5M; Black: 184k; Latino: 93k.

	Men	Women	White	Black	Latino	All	All NLS-72
Ocupational/Professional							
Agric Business & Econ	2.1	1.3	1.9	0.5	0.8	1.7	**1.8**
Agric. Production	3.5	1.6	2.8	0.5	1.4	2.5	**3.7**
Forestry	0.7	0.4	0.6	---	0.2	0.5	**1.3**
Envir. & Nat.Resources	8.1	5.7	7.4	2.8	6.9	6.8	**7.4**
Accounting	30.9	32.2	33.3	23.2	24.2	31.6	**23.9**
Fin/Insure/Real Est	20.6	15.6	19.4	10.2	12.0	17.9	**13.3**
Marketing	21.4	19.6	21.9	12.9	13.6	20.4	**13.5**
Bus & Mngmnt: Other	42.6	39.8	42.6	32.2	38.1	41.1	**31.2**
Architecture	2.7	2.1	2.5	1.2	2.4	2.4	**3.0**
Engineering Mech/Phys	9.3	1.3	5.2	2.1	3.2	5.0	**3.9**
Engin & Tech Drafting	12.2	2.1	7.0	4.0	6.8	6.7	**5.9**
Engineering: Other	16.5	3.1	9.6	5.2	6.8	9.2	**7.0**
Electronic Technols.	12.0	1.6	6.6	4.7	5.8	6.4	**4.4**
Engin Technol: Other	16.3	2.5	9.1	5.7	9.6	8.8	**8.0**
Special Education	1.6	5.9	4.1	4.3	1.3	3.9	**5.3**
Teacher Ed: Subject	4.7	12.0	9.0	6.8	8.9	8.6	**15.9**
Education: Other	7.3	15.5	12.2	10.0	9.9	11.7	**22.1**
Speech Pathol/Audiol	0.3	1.5	0.9	1.6	0.6	0.9	**2.0**
Clinical Health Sci.	0.9	3.4	2.5	0.5	1.1	2.3	**2.3**
Medicine, Dentistry	1.4	3.7	2.7	1.8	2.5	2.6	**3.4**
Nursing	0.6	6.8	4.2	2.9	3.0	3.9	**6.0**
Other Health Profess.	0.9	1.8	1.4	1.6	0.9	1.4	**2.9**
Journalism	3.6	4.5	4.4	2.2	3.3	4.1	**3.6**
Law	6.7	6.7	7.0	5.1	6.1	6.7	**6.8**
Protective Services	9.8	6.7	8.0	9.7	7.8	8.1	**5.5**
Military Science	5.7	1.4	3.3	5.2	1.2	3.4	**2.7**
Public Administration	4.0	2.7	3.4	2.5	3.2	3.3	**4.0**
Soc Work/Human Servs	4.6	10.8	7.9	9.3	7.6	8.0	**9.2**
Theology	6.3	8.6	8.5	3.9	3.3	7.6	**10.3**

Table 5.2.–Percent of Students Earning Undergraduate Credits in 99 Course Categories (cont'd)

	Men	Women	White	Black	Latino	All	All NLS-72
Vocational Fields							
Financial Serv Support	2.5	8.8	5.4	7.3	8.0	5.9	**4.4**
Office Occupations	7.0	21.3	13.9	21.5	17.5	17.2	**14.0**
Retail, Spec. Marketing	9.1	9.4	10.2	5.7	3.6	9.3	**7.0**
Med Lab/Clinic Tech.	1.0	3.4	2.4	1.4	2.3	2.3	**2.3**
Hlth/PhysEd/Rec (HPER)	4.4	5.9	5.3	4.9	4.8	5.2	**8.1**
Health Servs: Other	7.7	18.1	13.8	10.5	13.0	13.3	**8.9**
Personal Services	0.7	3.4	2.2	2.4	2.1	2.1	**0.7**
Vocational Home Econ	2.4	8.5	5.8	6.2	3.7	5.7	**2.9**
Building Trades	2.8	0.1	1.4	0.9	2.2	1.4	**1.1**
Mechanics/Repair	10.6	0.4	4.9	4.2	5.6	5.1	**5.7**
Precision Production	7.2	1.9	4.5	3.0	4.0	4.4	**4.9**
Transportation	2.6	0.3	1.5	0.6	1.3	1.4	**1.4**
Communic. Technology	4.3	3.0	3.8	2.7	1.9	3.6	**2.1**
Science							
Agricultural Science	4.2	2.9	4.0	1.6	1.4	3.5	**4.5**
General Biology	26.8	35.8	32.4	30.4	20.8	31.6	**36.3**
Biol Service Courses	7.2	20.4	14.6	13.4	14.1	14.3	**12.3**
Biol Sci: Other	13.5	23.2	19.4	13.8	15.4	18.7	**27.7**
General Chemistry	25.7	20.3	23.9	12.9	18.5	22.8	**29.0**
Chemistry Electives	8.4	7.0	7.9	5.4	3.6	7.7	**9.0**
Geology & Earth Sci.	14.6	11.1	13.7	6.4	9.5	12.7	**17.3**
Physics	24.1	11.0	18.0	8.1	10.7	17.0	**18.0**
Other Physical Sci	18.6	14.7	17.2	12.5	13.6	16.5	**20.3**
Mathematics/Statistics							
Pre-College Math	29.0	34.2	29.7	44.4	43.3	31.8	**32.9**
Intro Coll-Level Math	46.3	41.6	45.3	34.7	36.5	43.8	**30.9**
Calculus & Adv. Math	27.7	14.9	22.1	9.7	13.9	20.8	**21.0**
Math Statistics	18.6	16.4	18.7	10.4	9.7	17.4	**13.7**
Soc & Econ Statistics	4.4	5.9	5.5	1.7	4.8	5.2	**4.2**
Other Math	11.2	6.6	8.5	10.2	9.5	8.7	**7.2**
Computer Sci & Related							
Data Proc/Comp Applic	22.8	18.8	21.3	15.6	18.9	20.6	**9.7**
Computer Programming	21.5	13.5	17.7	12.9	16.4	17.2	**7.9**
Computer Science	26.2	20.2	24.3	14.9	18.7	23.0	**8.7**

Table 5.2.–Percent of Students Earning Undergraduate Credits in 99 Course Categories (con'td)

	Men	Women	White	Black	Latino	All	All NLS-72
Personal Development							
Career/Job Skills	15.6	17.3	16.3	18.7	17.1	16.5	**5.0**
Phys Ed Activities	54.0	54.5	54.6	51.6	52.3	54.3	**61.6**
Interpers Relats, etc.	13.0	17.3	15.7	14.7	12.6	15.3	**11.6**
Communication							
Oral Communic., Speech	41.7	47.4	45.6	43.5	39.5	44.7	**42.5**
Remedial Engl/Writing	26.4	31.9	25.4	50.5	45.8	29.3	**25.7**
Compos, Exposition etc	72.7	76.1	75.8	68.6	67.2	74.6	**68.9**
Humanities							
Foreign Languages	23.0	29.9	26.8	18.4	35.7	26.7	**28.0**
Literature & Letters	38.2	43.6	43.5	29.8	27.7	41.1	**51.8**
Ethics	9.4	10.5	10.8	5.0	6.9	10.0	**7.0**
Philos & Relig Studies	30.7	30.6	32.5	21.7	19.3	30.7	**33.7**
Social Sciences							
U.S. Hist/Amer. Civil.	40.3	35.1	38.6	30.7	35.3	37.5	**40.3**
Western Civ/Wrld Hist.	21.6	21.1	22.0	17.8	15.5	21.4	**24.6**
History: Other	16.1	11.6	14.9	7.9	7.1	13.7	**18.8**
Ethnic/Culture Studies	3.4	4.2	2.6	10.2	6.3	3.8	**5.5**
Women's/Gender Studies	2.5	9.0	6.2	3.9	5.6	6.0	**3.5**
Area Studies	6.3	6.1	6.6	2.8	5.6	6.2	**4.7**
Internat. Relations	7.8	5.0	6.9	2.2	4.3	6.3	**5.4**
General Psychology	47.6	58.9	55.8	41.4	48.1	53.7	**56.7**
Developmental Psych	5.8	19.9	13.9	11.6	10.1	13.4	**16.8**
Psychology: Other	21.6	29.1	26.7	18.4	21.4	25.6	**26.9**
Interdisc. Social Sci.	12.3	10.1	11.1	12.6	10.4	11.1	**15.1**
Anthropology/Archeol.	13.1	15.9	15.3	9.8	10.8	14.6	**19.5**
Intro. Economics	44.6	33.1	40.5	26.0	26.2	38.4	**31.5**
Economics: Other	15.7	11.5	14.2	10.3	8.2	13.5	**14.4**
Geography	16.0	12.5	15.5	5.1	9.4	14.1	**19.5**
U.S./State/Constit Govt	27.4	24.5	26.0	23.8	26.5	25.8	**29.0**
Political Sci: Other	14.5	11.3	13.7	7.2	7.9	12.8	**14.1**
Intro. Sociology	29.8	39.8	36.4	30.5	29.3	35.2	**39.2**
Sociology: Other	15.3	23.4	20.5	16.9	13.9	19.6	**25.1**

Table 5.2.–Percent of Students Earning Undergraduate Credits in 99 Course Categories (cont'd)

	Men	Women	White	Black	Latino	All	All NLS-72
Applied Social Science							
Mass Commun, Radio,TV	14.0	14.3	15.4	8.1	8.0	14.2	**12.7**
Academic Home Economics	7.8	19.5	14.5	12.9	11.1	14.1	**16.3**
Recreation & Sports Stu	7.4	4.7	6.1	5.8	4.7	5.9	**4.7**
Fine, Applied & Performing Arts							
Graphics, Design	8.1	9.1	9.1	6.4	6.0	8.6	**9.6**
Art History	12.2	16.6	14.8	13.3	11.3	14.6	**16.2**
Fine Arts	14.3	19.0	17.5	12.5	13.2	16.8	**20.3**
Theatre, Dance	10.4	10.0	10.7	6.7	10.4	10.2	**9.9**
Film Arts	10.4	9.6	10.8	4.1	7.3	10.0	**8.9**
Music Performance	7.8	9.0	8.9	6.8	5.4	8.5	**11.7**
Music: Other	21.7	20.5	20.9	22.0	18.6	21.0	**23.7**

Sources: National Center for Education Statistics: High School & Beyond/Sophomore Cohort, NCES CD#98-135 and the National Longitudinal Study of the High School Class of 1972.

Section 6:

Undergraduate Grades: A Complex Story

If one is to judge from newspaper articles and editorials, we are fascinated by grades in education, almost as fascinated as we are with indicators of athletic performance in the sports section or with various market averages in the business section.

Within these sections of the daily newspaper, grades are similar to earned run averages in baseball, or the weighted ratings for quarterbacks and mutual fund managers. These are all, putatively, transparent indicators of performance, though we probably understand grades far better than ERAs. Over the past decade or two, a folklore of grade inflation in higher education has accumulated as a result of single-institution studies at elite schools such as Stanford, Harvard, and Amherst. These studies are then repackaged with headlines such as "A for Effort — or for Showing Up."

At an earlier stage of editing the High School & Beyond transcript sample, I wrote a short piece about this issue to illustrate what the unobtrusive evidence of national data can do with such folklore ("A's Aren't That Easy," *The New York Times*, May 17, 1995). The points are worth repeating here, particularly now that the transcripts have been fully edited and we understand better how to program them in matters of grades so as to deal with institutional idiosyncracies.

The first — and major — point, illustrated in table 6.1, is that, judging by both distribution of letter grades and GPAs, there has been no grade inflation in U.S. higher education since the High School Class of 1972 went to college. Some grade inflation may have occurred before that time, during the Vietnam War, but a reference point of 1968 is not very convincing for 1995 analyses. In fact, grades appear to have *declined* slightly, particularly for women, for those who earned bachelor's degrees, and for selected majors. The judgment of the magnitude of change in mean GPA across two cohorts is determined by the effect size: anything less than ± .10 is insignificant (see Appendix A).

To be accurate, and fair, the concept of "inflation" does not apply to data about distribution of letter grades or GPAs. "Inflation" references an underlying commodity, the quality of which may change in time. There is no reliable way to determine the changing quality of undergraduate work that lies behind the grade. One would need, subject by subject, samples of student work responding to the same "prompts," judged by the same faculty members using the same criteria, over two or three decades in order to determine the changing relationship between grades and performance. Only then could one determine whether "inflation" was at work.

The more interesting — and serious — issue in changes of grading practices from the 1970s through the early 1990s is the growing proportion of withdrawals, incompletes, and no-credit repeats, all of which are all now treated as non-penalty grades by many institutions. There is an unhappy paradox here, however: what is sold as "non-penalty" actually involves a more subtle penalty. The time one loses in such situations is time one must recoup at a later point. Perhaps the increase in withdrawals has had some impact on increased time-to-degree for those who earn degrees.

Most of these phenomena, and their variations, are reflected in Table 6.2, created in response to many inquiries received subsequent to the publication of the first edition of this volume in 1995. Table 6.2 uses only the High School & Beyond/Sophomore cohort's undergraduate grades, and presents the distribution of those grades by institutional type, control, and selectivity.

Pointers for Interpretation:

1) Women have earned higher grades than men in college for at least the past two decades, whether women were in a minority (NLS-72) or majority (High School & Beyond).

2) Women's grades declined more than men's, and the standard deviation rose. According to statistical conventional wisdom, this is what happens when a population engaged in a particular activity expands.

3) While business became the most populous field in higher education, it moved from the bottom of the barrel in the GPA sweepstakes to ninth position (out of 12).

4) Less than 2-year and specialized institutions award a higher percentage of As than community colleges and 4-year colleges. But the more selective the institution, the more the grade distribution is tilted toward the upper end of the continuum.

5) Both highly selective colleges and institutions that are "not rated" (these are principally less-than-2-year schools) award a higher percentage of their grades in the "P" category (pass, credit, no-grade) than other types of postsecondary institutions.

6) Withdrawals, incompletes, and repeats are concentrated in remedial courses, all mathematics courses below calculus, and a number of "gateway" courses for students intending to major in a specific field (for example, introductory accounting, psychological statistics). The highest rates of these grades are found in community colleges.

7) Failure rates are also high in remedial courses in both math and English. A significant proportion of remedial students have academic backgrounds so weak that they cannot complete even pre-collegiate courses.

8) The list of courses in which a high percentage of students receive "As" is dominated by teacher education. The juxtaposition of this observation with the two preceding observations is ironic, to say the least.

Table 6.1.–Changes in Undergraduate Grades and Grade Point Averages of Students in the National Transcript Samples, 1972-1993

NLS-72 = High School Class of 1972 in 1984 (age 30)
HS&B/So = High School Class of 1982 in 1993 (age 29)

I. Distribution of Letter-Equivalent Grades

Universe: All credit-bearing undergraduate courses; all institutions.

	NLS-72	HS&B/So
As	27.3%	25.2%
Bs	31.2	31.9
Cs	21.9	22.2
Ds	5.4	6.0
Fs/Penalty Grades	3.8	4.5
Pass/Credit, etc.	6.4	2.9
Withdrawal, Repeat	4.0	7.3

II. GPAs for Students Earning >10 Credits (standard deviations are in parentheses).

	NLS-72	HS&B/So	Effect Size
ALL	2.71 (.64)	2.65 (.71)	-.09
Men	2.61 (.64)	2.60 (.72)	-.02
Women	2.81 (.63)	2.70 (.70)	-.17
White	2.75 (.63)	2.73 (.69)	-.02
Black	2.26 (.61)	2.22 (.74)	-.06
Latino	2.47 (.63)	2.44 (.64)	-.03
Less than BA	2.48 (.69)	2.48 (.78)	.00
BA or higher	2.94 (.49)	2.88 (.51)	-.12
Business	2.78 (.49)	2.81 (.48)	+.03
Education	2.97 (.44)	2.91 (.41)	-.10
Engineering	2.93 (.52)	2.89 (.56)	-.05
Physical Sci	2.93 (.49)	2.87 (.65)	-.13
Math/Comput Sci	3.09 (.54)	3.01 (.50)	-.15
Life Sciences	2.98 (.48)	3.00 (.49)	+.01
Health Sci/Servs	3.02 (.44)	2.91 (.43)	-.14
Humanities	3.08 (.50)	3.01 (.47)	-.11
Arts	3.06 (.45)	3.05 (.45)	.00
Social Sciences	2.95 (.51)	2.85 (.56)	-.16
Applied Soc Sci	2.87 (.45)	2.78 (.50)	-.14
Other	3.05 (.47)	2.89 (.52)	-.22

Table 6.2.–Distribution of Undergraduate Grades by Institutional Type, Control, and Selectivity: High School and Beyond/Sophomore Cohort. 1981-1993

	A	B	C	D	F*	P	DWI**	Pct. of All Grades
Type/Control								
Doctoral, Public	25.2	33.7	23.5	5.9	4.3	3.0	4.4	25.1%
Doctoral, Private	27.1	36.2	19.9	5.0	3.0	4.7	4.1	6.5
Comprehensive, Public	24.1	31.2	23.5	6.7	5.8	2.1	6.7	22.7
Comprehensive, Private	25.0	36.1	24.0	6.3	3.3	1.5	3.9	8.2
LibArts, Public	*23.4*	*26.3*	*21.6*	*7.1*	*7.2*	*7.8*	*6.6*	0.5
LibArts, Private	26.8	36.6	21.7	5.4	2.8	4.0	2.8	6.1
Community College	24.5	27.2	21.0	6.0	6.9	1.5	13.0	24.7
Specialized	29.0	35.1	19.0	4.6	3.3	4.9	4.1	3.2
<2-Year	30.4	28.0	17.4	3.5	3.2	15.1	2.3	3.0
ALL:	25.2	31.9	22.2	6.0	4.5	2.9	7.3	
Selectivity								
Highly Selective	27.5	42.0	16.4	2.9	2.3	7.4	1.5	3.3
Selective	26.7	36.0	21.2	5.1	3.3	3.9	3.8	10.4
Non-Selective	24.9	32.7	23.6	6.4	4.8	2.4	5.3	58.4
Open Door	23.8	27.2	20.9	5.8	6.9	2.4	13.0	24.7
Not Rated	35.2	29.0	17.4	4.5	3.3	8.7	2.0	3.2

Notes: (1) *All penalty grades are included under "F." **Drops, Withdrawals, Incompletes, and No-Credit Repeats. (2) None of the estimates for the row in italics is statistically significant. (3) Rows may not add to 100.0% due to rounding. Source: National Center for Education Statistics: High School & Beyond/Sophomore Cohort, NCES CD#98-135.

Table 6.3–Undergraduate Courses With Highest Rates of Withdrawals, Repeats and Incompletes: High School & Beyond College Transcript Sample (1981-1993)

Universe: All HS&B undergraduate course grades in degree-granting institutions that were not flagged as transfer courses, journal entries, or credit-by-examination. Only those courses with 100 or more enrollments out of 267,400 unweighted cases were considered. Physical education and personal development courses were excluded.

Course	Percentage of Grades that were W's, NCR's, or I's*	CCM Code
ALL	**7.3%**	------
Plane Geometry (pre-collegiate)	23.7%	270104
Developmental Math	22.5	270199
Pre-Collegiate Algebra	21.6	270103
Gen Pre-Collegiate Math	17.1	270101
Business Math (arithmetic-based)	16.9	270901
Arithmetic	16.5	270102
College Algebra	15.9	270203
Drafting: Intro, General Technical	15.8	480101
Accounting: Introductory	15.7	60201
Renewable Nat. Resources/Energy	15.0	30101
Applied/Liberal Arts Chemistry	14.9	452001
Pre-Calculus/Analytic Geom/Analysis	14.8	270204
Airplane Piloting & Navigation	14.5	490102
Remedial English/Writing	14.5	232001
Calculus for Business, etc.	14.5	270602
Remedial Reading	14.2	232002
Clerk-Typist	14.3	70702
Computer Programming	14.0	110201
Account & Bookeeping Support: General	14.0	70101
Computer Applications: Business	13.9	110603
Business Math (algebra-based)	13.5	270902
Algorithms/Computer Logic	11.9	110202
Business Computer Programming	11.7	70301
Psychological Statistics	11.5	421501
Data/Discrete Structures	11.5	110302
Medical Terminology	11.4	172001

*Some grades of "Incomplete" carry penalties; some don't. These are all no-penalty grades. 'NCR' means "No Credit Repeat." 'W' means "Withdrawal." 'WP' (Withdrew-Passing) grades are included with the W's. 'WF' is a penalty grade, and is not included here.

Table 6.4. Undergraduate Courses with Highest Rates of Failure/Penalty Grades: High School & Beyond College Transcript Sample (1981-1993)

Universe: All HS&B undergraduate grades in degree-granting institutions that were not flagged as transfer courses, journal entries, or credit-by-examination. Only those courses with 100 or more enrollments out of 267,400 unweighted cases were considered. Physical education and personal development courses were excluded.

Course	Percentage of Grades that were F's, WF's, U's*	CCM Code
ALL	**3.9%**	------
Computer Organiz/Machine Lang	11.2%	110203
Intro College-Level Math	9.5	270201
Gen Pre-Collegiate Math	9.4	270101
Pre-Collegiate Algebra	9.4	270103
Developmental Math	8.6	270199
Hispanic-American Studies	8.6	50203
Engineering Mechanics/Statics etc.	8.5	141101
English: Grammar & Composition/Reading	8.4	230402
Pre-Calculus/Analytic Geometry/Analysis	8.2	270204
College Algebra	7.6	270103
Remedial English/Writing	7.5	232001
Business Math (arithmetic-based)	7.5	270901
Renewable Nat. Resources/Energy	7.5	30101
U.S. History Surveys	7.4	450810
Busin & Society, Soc. Respons of Bus	7.3	60103
Native American Studies	7.3	50202
Calculus (regular)	7.3	270601
Data Processing	7.0	110301
African-American Studies	7.0	50201
General Biology	6.9	260101
Cultural Geography	6.9	450703
Admin of Justice/Court Administration	6.8	430103
Office Machines/Machine Billing	6.8	70104
Business Computer Programming	6.8	70301
Electromechanical Technologies	6.8	150403
Life Science for Liberal Arts	6.8	262001

*'WFs' (Withdrew-Failing) are included in this chart, along with standard symbols for failure (F, E, and U). So are unresolved Incompletes that became failures. Some colleges and community colleges do not award credits for remedial courses. If such a "non-additive" course is failed, it is not included here.

Table 6.5. Undergraduate Courses With Highest Rates of A's and High Honors Grades: High School & Beyond CollegeTranscript Sample (1981-1993)

Universe: All HS&B postsecondary course grades in degree-granting institutions that were not flagged as transfer courses, journal entries, or credit-by-examination. Only those courses with 100 or more enrollments out of 300,000 unweighted cases were considered. Personal development courses were excluded.

Course	Percentage of Grades that were A+, A, A-, HH, HP*	CCM Code
ALL	**25.1%**	
Varsity Athletics: Minor Sports	67.4	360202
Music Performance	63.1	500903
Varsity Athletics: Major Sports	61.8	360201
Education: Curriculum/Curric Theory	54.6	130301
Military Science (Army ROTC)	53.5	280301
Radiologic Technology	52.3	170209
Elementary Education	51.8	131202
Japanese: Intro and Intermediate	51.1	160302
Music Education/Pedagogy	50.5	131312
Teacher Ed: Social Studies	49.7	131318
Sign Language/AMESLAN	49.4	170410
Secondary Education	49.3	131205
Social Work Practicums	48.0	440710
Physical Therapy	47.8	170813
Office Software other than Word	47.3	70802
Sports Officiating, Refereeing	47.1	310501
Business Internships/Co-Op	46.6	63001
Music History: Classical	46.5	500906
Teacher Ed: Physical Education	46.2	131314
Teacher Ed: Reading Education	46.2	131315
Education: Materials and Methods	46.2	130302
German: Advanced, Literature	46.0	160521
Education/Instructional Media	45.9	130501
Teacher Ed: Arts Education	45.7	131302
Communications Internships/Co-Op	45.5	92001

*In schools with grading systems based on degrees of "Pass" or "Honors," the grades included here ('HH'--for High Honors, and 'HP'--for High Pass) were judged to be the equivalent of As.

Conclusion: Next Steps and Illustrative Issues

Developing national data sets (particularly longitudinal studies) and learning to use them is somewhat like mastering a piano concerto. First you study the structure, learn the movements and sub-movements, practice hands separately, hands together, find the difficult passages and play them backwards. You make a tape, listen to it, figure out where the passages are rough or where you think a different interpretation would enhance the performance. Then, just when you think you are on the road to Carnegie Hall, you realize that there is a whole orchestra and orchestral score that surrounds the solo, that sets the stage, and fills in the passages.

The college transcript records are analogous to the solo: they cannot be played without the full orchestra and score. Any of the topics we have touched upon in this volume to illustrate the power and range of the transcript records are incomplete without connection to the lives of the students who "own" those records. Longitudinal studies are life histories, and college records are but parts of lives.

The longitudinal studies of the National Center for Education Statistics contain a wealth of information. There are surveys of the students that cover aspirations, plans, attitudes, values, family background, family formation, assessments of high school experiences, and labor market experience (jobs, occupations, employers, wages, unemployment, and job satisfaction). There are high school transcripts, test scores, military records, financial aid records, and high school characteristics. For sub-samples of the students in High School & Beyond there are surveys of parents, teachers, and high school principals. There are thousands of variables, and some are worth more than others.

Whatever we do with the postsecondary records fits into the life stories that can be aggregated from all this other information. Because they are artifacts, transcripts reveal something new every time you look at them. Hence, the editorial process continued to discover the possibility of new variables that could be derived from the artifacts and added to the collection of analytical tools. For example, in the most recent edition of the High School & Beyond CD-ROM NCES #98-135), we have added flags to indicate transcripts from historically black colleges, Hispanic-serving institutions (HSIs), women's colleges, and graduate or professional schools. That was easy.

More difficult to construct were variables for continuous enrollment, completeness of record, true institution of first attendance, and study abroad. Every record was read, line by line, to establish these variables. They cannot be constructed by algorithm, that is, by mere programming. And every time we read a record line-by-line, we inevitably found something else that had to be corrected, something we didn't see before, or something it would be helpful to flag for analysts. For example, there are some records in High School & Beyond that appear to originate in "adult basic school" programs of community colleges, are not really "postsecondary," hence should not be included in course-taking analyses. What would happen to our presentation of incidental students (table 2.3) or any of our calculations involving remedial courses, if these records — which are not really college records — were removed from the universe? It is easy to remove trade school records or AVTI records to narrow the field to degree-granting institutions. But these other cases are not easy to find and validate.

There is also the matter of absolute accuracy of highest degree earned. Some 95 percent of the students in the High School & Beyond transcript sample participated in a 1992 computer assisted telephone interview (CATI) survey in which they were asked about the various credentials and degrees they earned between graduating from high school and June of 1992. We compared their responses to what the transcript file said, and found a number of discrepancies. Some discrepancies indicated either that the students did not understand the question or the telephone interviewers made errors in entering data. For example, there were 244 cases (out of 8,395) in which the students said they had no degree, but the transcript file showed credentials as high as master's degrees (to be sure, including some earned after June, 1992). For another example, 44 percent of the students who claimed they had earned doctorates had actually earned first professional degrees in medicine and law.

Users of the CD-ROMs for both the NLS-72 and the HS&B/So have an example of a "score" we developed for that transcript sample; and it is one they can manipulate whenever they disagree with its assumptions. For example, there is a variable focusing on community college attendance patterns that employs a "cascading" logic. At each step of the "cascade," whatever group of students remains from the previous steps is sorted by criteria that include "more than 10 credits from a community college." Some analysts disagree with that, and want to use 12 credits. The program is set up so that they can substitute their preference.

Without a larger orchestral score that draws critical features of life histories into the pool of explanation, analysis will suffer. Take, for example, the students who earned 60 or more credits by the time they were 30 but who never earned a degree of any kind *and* who are no longer in school at age 30 (table 2.3). In both the NLS-72 and HSB/So cohorts, this group constitutes one out of every 12 students in U.S. postsecondary education, and one out of every eight minority students. The transcript records take us only so far toward figuring out why they did not finish degrees, why they left school, and what it would take to help them finish. Until we see how they differ from other students in terms of high school curricula, family formation, financial aid patterns, geographic mobility, and labor market experience, no one can come up with compelling guidance for college student personnel officers and academic advisors. In his seminal work on college drop-outs, Tinto (1987) suggested that institutions develop "early warning systems" that can spot and track students who may have difficulty completing programs. Both the life histories in longitudinal studies and the transcript records can be powerful resources for academic advisors and student personnel officers looking for signs of looming trouble. And it is that kind of guidance towards which the *Course Map* drives.

The Limitations of the Transcript Files

Even within life histories, there are a number of stock research questions that our postsecondary transcript samples address but imperfectly. A few illustrations would help users of this volume understand its limitations, and suggest alternative ways of dealing with those questions.

So How Are Things in Texas?

One of the most frequent questions asked of national longitudinal studies runs something like, "Can we get an analysis for Texas?" Unfortunately, the data bases are not constructed to yield analyses by state. The initial sampling designs had a regional variable based on the location of the high school from which the student graduated or last attended (states were aggregated to 9 Census divisions for this purpose) but the analytical power — let alone intrinsic interest — of that variable diminishes in time as students move from one part of the country to another and as the universe of survey respondents shrinks (e.g. for the High School and Beyond/ Sophomore surveys, from 28,000 in 1980 to 14,825 in 1992). To achieve even the possibility for state-based analyses would require a sample ten times the size of the original, and at a staggering cost.

A more profitable approach to geographic inquiries of the longitudinal data bases would be based on tracking the mobility of the participants over the 10, 12 or 15 years of the surveys. Each time a survey is conducted, the respondent is asked how far (in miles) his/her current residence is from his/her place of residence in the previous survey. An individual who moves frequently and far evidences a high degree of geographic mobility (or instability, depending on the analytical issue) that may be correlated with other life-course events and educational histories. I tried this analysis using the NLS-72 surveys, and found that, through age 26, 42 percent of the original survey participants who had attended college and had not served in the military basically did not move away from the community in which they attended high school, while 31 percent had moved more than 200 miles away more than twice. If you were in the latter group, and had graduated from high school in Texas, you might still be within state lines. Had you started in Rhode Island, you might have lived in a half-dozen states.

This particular inquiry was conducted in the context of creating variables that might illumine the history and fate of the long-term non-completer group of students (60+ credits but no degree of any kind at age 30). Geographic mobility or stability turned out to have a very weak correlation with college attendance and completion patterns. It was helpful to set aside that factor and pay more attention to others.

Are You Full-Time or Part-Time?

In Carroll's (1989) analysis of students on the "persistence track" (entered college full-time immediately following high school graduation), shifting to part-time status was one of the key factors accounting for failure to complete credentials. Carroll's sources of data were student responses to survey questions. These turn out to be far more reliable than transcripts in determining full-time or part-time (FT/PT) status.

The transcript files cannot yield an accurate mark on a student's FT/PT status. If we had no other information but the transcripts, we would have to create unambiguous "terms" for each student, and arrive at rules as to what constitutes a full-time term. Summer terms and terms ruled by clock-hour accounting would be particularly challenging for these rules. In reading the High School & Beyond/So student records, in particular, one is struck by the number of cases in which students are attending more than one institution simultaneously, with overlapping terms. In such cases, how does one judge whether the credits attempted add up to a full-time load, and, if so, for what period? How, too, does one judge a "term" in which a student withdrew from or dropped courses? I may start with a full-time load, but conclude with a credit line significantly below the threshold for full-time. Given these complexities, analysts should follow Carroll's approach or a modified version used by Fitzgerald et al (1994) to track students who entered postsecondary education for the first time in 1989-1990.

Status of the Data Bases

Both the NLS-72 and HS&B/So archives are available on CD-ROM, with an electronic codebook included, from the National Center for Education Statistics. The public release version of the NLS-72 archive is unrestricted, that is, it is possible to identify particular institutions. The public release version of HS&B/So is restricted, which means that some data elements such as institutional codes, are not included. In preparing the postsecondary transcript portion of HS&B/So for a second edition CD-ROM, we are striving to add variables that will render the public release version more user-friendly and give it more analytical power.

Coming up in the saga of longitudinal studies sponsored by the National Center for Education Statistics is the last round of interviews with students in the third of these cohorts, the so-called NELS-88 (National Education Longitudinal Study of 1988, begun when its sample was in the 8th grade). These students will be 26/27 years old when they are interviewed in 2000. If we gather their college transcripts in 2001 and subject them to the same type of editing and analyses one sees in this volume, we will have a national archive covering 30-year trends in course-taking, college attendance patterns, grades, and attainment. That will be an achievement of major proportions.

Appendix A

Notes on Accuracy of Estimates, Statistical Procedures, Standard Errors of Measurement, and Effect Size

There are different kinds of statistics in *The New College Course Map and Transcript Files*, but all of them are estimates derived from samples. Even in the rare cases where, for complex reasons, the data are unweighted (table 4.1, for example), readers must remember that they are looking at a sample, not a census of an entire population.

Two kinds of error occur when samples are at issue: errors in sampling itself, particularly when relatively small subpopulations (for example, Native Americans) are involved; and nonsampling errors. Even in surveys as large as the NLS-72 or High School & Beyond, sampling errors can affect estimates of statistical significance.

Nonsampling errors are more serious matters. A good example of a nonsampling error would be the fact that we are missing transcripts for some students in both the NLS-72 and HS&B/So transcript files. We are missing those transcripts either because the student did not tell us he/she attended the school, the school refused to send the transcript, the school could not find the transcript, or the information sent by the school was not really a transcript. In this case, we could mitigate the effect of missing transcripts by differential weighting of the population, and, indeed, for the HS&B/So, the analyst is given the choice of two weights, one of which is confined to students with complete records. Weighting, though, will not address the panoply of sources of nonsampling error.

The effects of sampling and nonsampling errors ripple through data bases. To judge the accuracy of any analysis, one needs to know the effects of sampling and nonsampling errors. When the unit of analysis is the student, this is a straightforward issue because the original samples in the longitudinal studies consisted of students. When we ask questions about highest degree earned (table 2.1), undergraduate credits earned (table 4.1), the distribution of bachelor's degree majors (table 2.5), and undergraduate grade point averages (table 6.1), we are asking questions about non-repetitive behaviors of students who were sampled. One does not have two highest degrees earned or two undergraduate GPAs.

When the unit of analysis is an instance of enrollment in a specific course (table 5.1), credits earned within a course category as a percentage of all credits earned (table 4.1), or the distribution of grades within course categories (tables 6.3-6.5), the statistical issues are not so straightforward. While all these units of analysis involve student behavior, that behavior is usually repetitive. A student may make five attempts at degrees in two different fields in five different schools. A student may take courses in the same category, for example, electrical engineering, in two different institutions and receive different numbers of credits on each occasion (table 4.1). Ten--and only ten--students out of 8,395 may take a dozen courses in the same broad category, for example, chiropractic, and receive grades of 'A' for all of them. All these cases render the tasks of weighting the data and determining its accuracy more difficult. In fact, these cases illustrate the differences between analysis of transcripts and analysis of survey responses.

The descriptive comparisons in this volume dealing with non-repetitive student behaviors are based on what is called "Student's *t*" statistics that require standard errors of measurement. The basic formula for computing "Student's *t*" values is simple:

$$t = (P_1 - P_2) / \sqrt{(se_1^2 + se_2^2)}$$

where P_1 and P_2 are the estimates to be compared and se_1 and se_2 are the corresponding standard errors. In this case, if $t \geq 1.96$, one has a statistically significant difference. The formula becomes more complex, however, when comparing dependent variables, and more complex, still, if one is making multiple comparisons among categories of an independent variable such as race/ethnicity. For multiple comparisons, the critical value for *t* rises following the formula for Bonferroni Tests: if *H* comparisons are possible, the critical value for a two-sided test is $Z_{(1-.05/2H)}$.

Because neither the NLS-72 nor High School and Beyond was based on a simple random sample of students, the technique for estimating sampling error must involve a more complex approach known as the Taylor series method. To produce Taylor series standard errors, the estimates presented in this volume used a proprietary program, STRATTAB, provided by MPR Associates of Berkeley, California.

Table A.1 presents a sample of these standard errors for the most important tables in this volume, tables 2.1 and 2.2, "Highest Degree Earned by Students in the National Transcript Samples."

Means Across Cohorts and Effect Size

When we compare GPAs earned by students in two different age cohorts, the comparison of the behavior calls out for a measure of significance. This is a challenge. Each cohort is weighted differently and a common design effect, based on Taylor-series standard errors, is impossible to determine. An alternative strategy, however, is available and is reflected in Table 7.1. We take the mean GPA for each sub-group, pool the Standard Deviations, and determine the "effect size" of the change by dividing the difference in means by the pooled S.D. (Cohen, 1969) The formula for the pooled S.D is:

$$(N^1(SD^1) + (N^2(SD^2) / (N1 + N2)$$

The resulting effect size functions like a Standard Deviation unit or Z-score, that is, it tells us just how significant the change in the mean no matter what the appearance of the distribution. In the case of Table 6.1, the effect sizes are comparatively small (Bowen, 1973, p. 103).

Table A.1.–Standard Errors for Table 2.1: Highest Degree Earned by Students in the National Transcript Samples Who Earned More than 10 Undergraduate Credits

		None	Certif	Assoc	Bach	Some Grad	Mast	Prof/ Doct
All	NLS-72	0.59	0.28	0.37	0.60	0.22	0.27	0.21
	HS&B/So	0.86	0.51	0.48	0.76	0.40	0.34	0.21
Men	NLS-72	0.80	0.30	0.47	0.81	0.29	0.37	0.37
	HS&B/So	1.19	0.69	0.63	1.15	0.58	0.45	0.36
Wom	NLS-72	0.82	0.44	0.54	0.78	0.31	0.38	0.16
	HS&B/So	1.13	0.71	0.70	0.96	0.54	0.46	0.24
White	NLS-72	0.62	0.30	0.39	0.63	0.24	0.29	0.23
	HS&B/So	0.93	0.58	0.55	0.87	0.48	0.40	0.23
Black	NLS-72	2.03	0.80	1.15	1.54	0.40	0.91	0.53
	HS&B/So	2.10	1.36	1.22	1.51	0.69	0.63	0.42
Latino	NLS-72	2.58	1.52	1.82	2.11	1.28	0.71	0.59
	HS&B/So	4.34	2.73	2.55	3.84	1.02	0.38	1.12
Asian	NLS-72	4.06	0.73	1.95	4.24	2.14	2.56	2.15
	HS&B/So	3.42	1.27	1.64	3.75	1.43	1.43	2.63

Standard Errors for Table 2.2: Highest Degree Earned by Students Who Attended a 4-Year College At Any Time and Earned More than 10 Undergraduate Credits

		None	Certif	Assoc	Some Bach	Grad	Prof/ Mast	Doct
All	NLS-72	0.62	0.14	0.27	0.67	0.30	0.36	0.29
	HS&B/So	0.96	0.27	0.47	0.93	0.57	0.48	0.30
Men	NLS-72	0.88	0.14	0.36	0.95	0.39	0.49	0.49
	HS&B/So	1.28	0.37	0.67	1.37	0.81	0.62	0.50
Wom	NLS-72	0.90	0.26	0.42	0.95	0.44	0.53	0.23
	HS&B/So	1.27	0.36	0.61	1.25	0.77	0.67	0.36
White	NLS-72	0.64	0.15	0.28	0.73	0.32	0.39	0.31
	HS&B/So	1.01	0.31	0.50	1.04	0.66	0.55	0.33
Black	NLS-72	2.60	0.47	1.18	2.13	0.57	1.28	0.76
	HS&B/So	2.72	0.22	0.88	2.40	1.12	1.00	0.67
Latino	NLS-72	3.51	----	1.85	3.53	2.25	1.24	1.05
	HS&B/So	5.09	2.64	2.96	6.24	2.01	0.76	2.15
Asian	NLS-72	3.23	----	1.64	5.00	2.71	3.26	2.64
	HS&B/So	2.65	----	1.75	4.36	1.81	1.85	3.32

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